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Japan's Rapidly Rising Mineral Needs

THE rate at which Japan's economy has expanded in recent years has been truly remarkable. In 1959, growth was more than 16 per cent above that of the previous year. Last year witnessed a further increase of more than 11 per cent. It has been predicted that under the expansion programme of the present Japanese Government the rate of growth in 1961 and the two succeeding years will be in the region of 9.2 per cent, after which it will slow down to 7 per cent.

These aims have been described as over-ambitious, having regard to the recession in the United States and the economic problems being encountered in other markets. In fact, as recently as last August the Economic Planning Agency, which is the Japanese Government's chief adviser, predicted a downturn in the national economy during the first half of 1961. Fears have also been expressed as to the possibility that over-hasty expansion might lead to inflation, which would not only create major problems at home but would also make Japanese products more difficult to sell abroad, thus jeopardizing the plan of Prime Minister Hayato Ikeda to double the national income during the present decade. In order to achieve this aim Japanese exports are scheduled to reach $9,320,000,000 by 1970, a target which is nearly three times the figure for 1959.

Basic to Japan's economic ambitions are long-term plans for the expansion of metals production and a world-wide search for raw materials to supply the rapidly rising needs of steel mills, smelters, and refineries.

Last year mining and industrial production in Japan rose by 26.3 per cent from the previous year, according to the Ministry of Trade. This percentage increase was a record for the past ten years. In 1959 the rate of increase was 24.2 per cent.

Japanese production of crude steel amounted in 1960 to an estimated 22,000,000 tonnes compared with 18,300,000 tonnes in 1959. The target for 1970, announced last year as 38,000,000 tonnes, has been revised upwards to 48,000,000 tonnes, which would make Japan the third largest world producer. Japan's eight major steel manufacturing companies have announced plans to import a total of 17,850,000 tonnes of iron ore in the 1961/62 financial year. This represents an increase of 2,570,000 tonnes over 1960/61. Under the revised programme, the Japanese steel industry would require about 49,000,000 tonnes of iron ore in 1970. The industry's planners consider that existing suppliers will be unable to provide more than 31,150,000 tonnes annually, although imports from India, Goa, South America and Africa are expected to rise very sharply, and that new sources will have to be found in Alaska, Australia, the U.S.S.R., Mainland China and North Korea.

In the six months to September 30, 1960, Japanese coal production totalled 24,852,000 tonnes, an increase of 1,479,000 tonnes over the corresponding period in 1959. Supplies of coking coal,

however, have to be augmented by importation. Imports in the last financial year, from April, 1958, to March, 1959, totalled 5,116,000 tonnes, of which 3,166,000 tonnes were supplied by the United States. In the current financial year Japan will be importing about 7,000,000 tonnes of coking coal, more than half of which will come from the United States. The Yawata Iron and Steel Co. is to send a coal mining survey team to the United States to explore the possibility of joint development of coking coal reserves in that country for export to Japan. The plan is jointly sponsored by Yawata, the Fuji Iron and Steel Co., and the Nittetsu Mining Co.

Nevertheless the Japanese steel industry is hoping to reduce dependence upon the United States by increased reliance on Australia. A few days ago it was announced that 1,000,000 tons of coal would be shipped to Japan in the next five years by a New South Wales mining company, this contract being additional to coal orders which the company had already received from Japan. According to the Japanese Iron and Steel Federation, out of a total of 24,500,000 tons of coking coal to be imported by 1970, the United States and Australia are expected to supply 50 per cent and 22.9 per cent respectively compared with 77.8 per cent and 10.4 per cent at present. Negotiations have recently been in progress regarding the supply of Soviet coking coal to Japanese iron and steel firms.

Japanese requirements of electrolytic copper in the financial year ending March, 1961, are expected to total 240,000 tonnes, compared with 212,000 tonnes in the preceding financial year. To cater for the rising domestic needs, plans for new refineries of 1,000 tonnes and 1,500 tonnes per month capacity respectively were recently announced by Furukawa Mining and Mitsui Metal. Imports of ore and concentrates reached an estimated 120,000 tonnes in 1960, while production at domestic mines totalled 90,000 tonnes. Moreover, in view of the limited deposits at domestic copper mines, the percentage of imported ore can be expected to increase. This also applies to lead and zinc.

In order to extend their sources of supply Japanese copper smelters have been ranging far and wide. Nippon Mining is associated with Rio Tinto and the Itoh Trading Co. in a joint venture to mine copper concentrates in South-West Africa for shipment to Japan. Nippon Mining is also engaged in the development of copper mines in the Fiji Islands, Furukawa was recently reported to be planning to give financial and technical aid to the Santo Domingo copper mine in Chile. In Australia Mitsui has bought shares in Ravensthorpe Copper Mines, while Nippon is interested in known copper deposits N.E. of Port Moresby held under option by Consolidated Zinc. Indeed, it has been stated that, because of the discriminatory import controls imposed on copper by the Japanese Government, which result in a high metal price in that country, Japanese smelters are able to outbid an Australian smelter for copper concentrates.

Notes on the expansion of Japan's aluminium, magnesium and ferro-alloy industries apeared in our issue of December 9, p. 663, and the progress of the aluminium industry was the subject of a further reference in the following week's issue, p. 690. It has since been confirmed that the Mitsubishi Chemical Co. plans to build an aluminium plant in northern Japan to produce up to 50,000 tonnes annually from Australian bauxite. In general, Japanese aluminium refineries are showing great interest in Australian bauxite and could become important consumers of Weipa ore. Japan's aluminium capacity is expected to reach 720,000 tonnes by 1980, which compares with last year's output of 131,239 tonnes.

Whether Japan in setting its economic sights so high is endeavouring to do too much in too short a period is a question to which only time can bring the answer. Meanwhile Japanese purchases of ores and minerals and of a variety of metals are becoming a factor of growing significance in world markets. In Australia, Africa, the Far East, South and Central America, Japanese iron and steel or non-ferrous metal companies are participating in the development of the mineral industries by contributing capital or technical know-how to the exploitation of underdeveloped deposits. Hardly a week passes without an announcement of some further development in which a Japanese firm is associated either through a joint venture or by direct investment. Canada, too, is looking increasingly to Japan as a major outlet for its mineral exports.

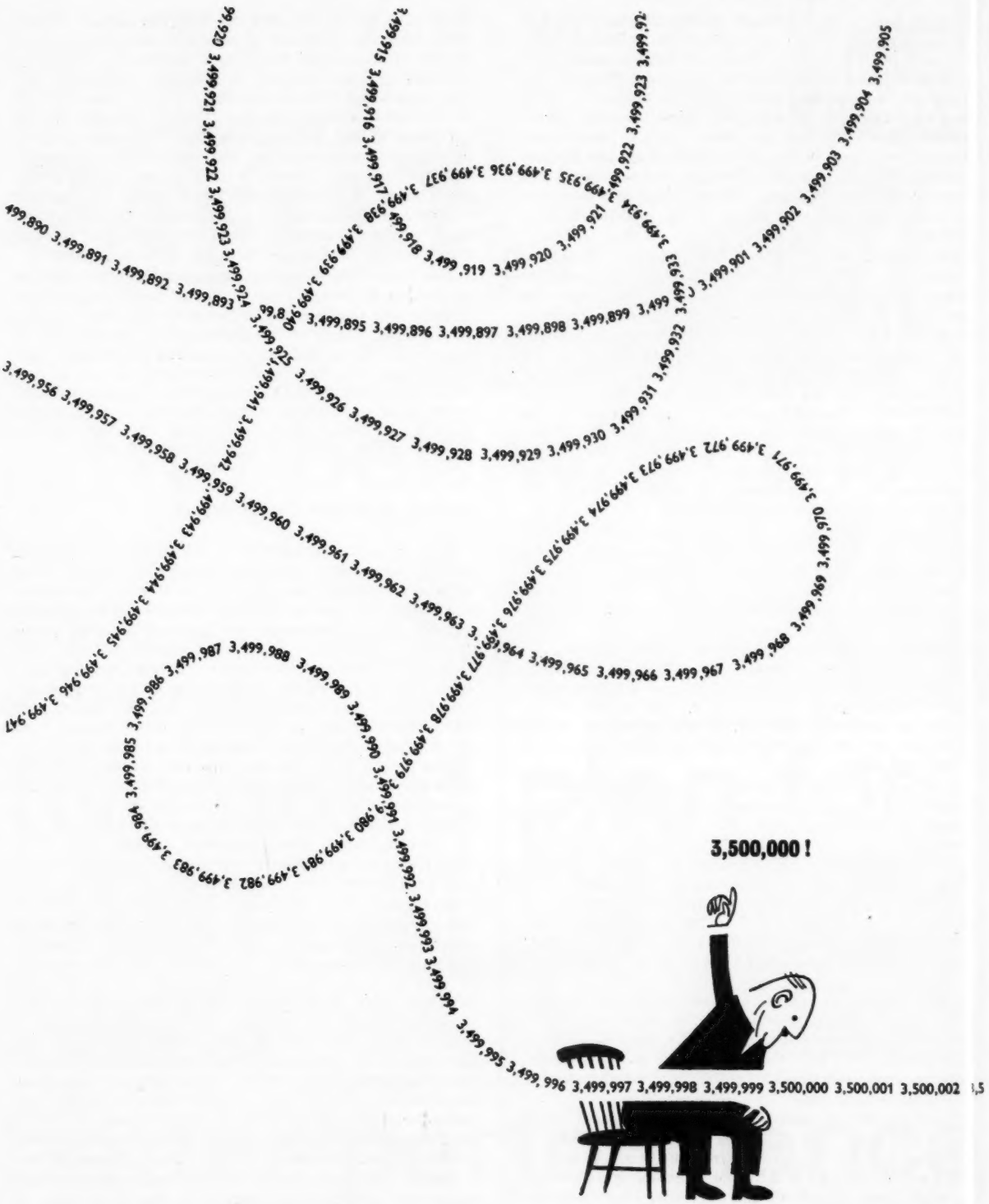
This vigorous policy of minerals procurement might be summed up as losing no opportunity of developing and preempting long-term sources of raw materials wherever they can be found. Can it be that Japan, with its rapidly increasing population and low *per capita* metal consumption, sees more clearly than the older industrial countries such as ourselves the impact of the Orient's growing demands on world resources of raw materials? Japan has always out-gambited us on labour costs. Is the time coming when she will also have the edge on us in raw material prices?

GHANA AND THE GOLD MINES

Last week, in commenting on Ghana's new law which imposes very heavy penalties for closing down a mine without permission, we suggested that it would be surprising indeed if the matters at issue between the government and the mining companies could not—and indeed would not—be resolved on a friendly and reasonable basis. The conflict of interests has arisen because Amalgamated Banket Areas and Bibiani cannot operate at a profit under present conditions, a situation which has been precipitated by the government's action in raising the minimum wage for Africans. Bibiani's ore reserves, in any case, are almost exhausted. Together, however, the two mines give direct employment to 14,000 workers, whose jobs the government is anxious to preserve, while the closing down of A.B.A. would be a blow to the important development project for the Tarkwa Valley. The government, therefore, wants to keep the mines in operation, but it is not prepared to provide any further financial assistance.

It now appears as if a practical solution to this problem has emerged without resort to drastic coercive measures which, in all probability, Dr. Nkrumah had no serious intention of implementing. The government now proposes to take over the four Ghana properties in the Western Selection and Development group — A.B.A., Ariston, Bremang and Ghana Main Reef—together with Bibiani. No bids are being made for the rich Ashanti company or for Konongo. The proposed terms are substantially higher than the current share prices, which, however, have been depressed by political fears, a truer basis for comparison being the prices ruling before the statutory wage increases were announced. The proposals are being considered by the companies and statements to shareholders will soon follow.

This is a text-book example of how an emergent country takes over foreign-owned assets if it should so wish. It is not unreasonable that the government should wish to own any mine which it proposes to subsidize and, provided the terms are sufficiently attractive, shareholders will not be disposed to reject them. Certainly there can be no comparison between Ghana's procedure and the methods adopted by some other foreign governments in past years. At the same time there is, of course, an element of compulsion which cannot be overlooked. Shareholders must necessarily consider the terms of the offer from a rather different basis than their approach to a normal commercial



3½ MILLION FEET DRILLED WITH VICTOR DRILL STEELS ON HYDRO-ELECTRIC CONTRACT IN 12 MONTHS

Victor Products (Wallsend) Limited, Wallsend-on-Tyne.

Victor

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'Grams: 'Victor' Wallsend

bill, inasmuch as the consequences of a refusal to accept them are completely unpredictable. Presumably the next step would then be arbitration.

From the market aspect, some of the mines in question are at or near the break-up stage, and share prices were valued accordingly. However, shareholders will have no cause to complain if the government, having taken the mines over at acceptable prices, decides to subsidize them and keep them in operation for an extended period.

ORE EXPLOITATION IN ANGOLA

The sanctioning by the Portuguese Government of an agreement between an international consortium and two Portuguese State-controlled companies for the exploitation of iron ore and manganese ore deposits in the Portuguese colony of Angola will lead to the building up of an ore-processing industry and later a ferrous metals industry in the colony, according to Angola's Governor-General Dr. Silva Tavares.

The agreement, which it was stated would be followed by others, is between Friedrich Krupp, of Essen, Hojgaard og Schultz, of Copenhagen, and Sociedade de Empreitadas e Trabalhos, of Lisbon, on the one hand, and Companhia Mineira do Lobito and Sociedade Mineira do Logibe—in both of which the Portuguese Government has a controlling interest—on the other.

Ores are to be processed before shipment, and necessary plants, which will be Portuguese Government - controlled, are to be built. Annual production is to be at an initial level of between 4,000,000 and 5,000,000 tonnes of ore, output in the Casinga area alone to stand at 1,000 daily tonnes in the first year of production, 2,000 tonnes after the first 18 months and 3,500 tonnes after the first 21 months. Technical plant, as well as an ore railway, is to be built by Krupps.

NORTHERN QUEBEC REOPENED TO PROSPECTORS

By an Order-in-Council, which came into effect on February 4, the northern areas of Quebec have been reopened to prospectors. For five years independent prospectors and developers have been debarred from operating in the vast territory of New Quebec (Ungava), which alone comprises an area of over 350,000 sq. miles, as well as from certain smaller areas south of the New Quebec line. Exploration licences at present in being are not affected. The new measure annuls various Orders passed by the Duplessis Government in 1955 and 1956, which had the effect of making the northern regions the special reserve of big operators.

Various reasons and excuses were proferred as to why prospectors should not be permitted to operate in this far northern region, recalls *The Northern Miner*. One was that, because of its distant location and the Arctic conditions that prevailed, the usual staking procedures could not apply and the Mining Act was being rewritten to incorporate new regulations in keeping with the problems involved. Another was that the country was a costly one in which to operate and it was desired to protect the public from inadequately financed ventures. Our contemporary suggests, however, that the most appealing factor, in all probability, was that the system gave government officials complete control over who should operate in the area. Companies or individuals wishing to carry out exploration could apply for a licence covering a specified area. To obtain such a concession required commitments for exploration that the average individual could not hope to finance. Thus exploration was channelled into the hands of a few companies or individuals, the smaller man being effectively barred.

In announcing the change of policy, Quebec's new Minister of Mines, the Hon. Paul Earl, paid tribute to the big operators, who, he said, had been responsible in many respects for the province's enviable position as a producer of minerals and for the opening of the country north of the St. Lawrence and in New Quebec. But it had also to be borne in mind, said the Minister, that, before granting of exclusive licences covering large areas, the first great iron deposits were discovered by prospectors and geologists. "Mines are found when the ingenuity of individual initiative is allowed full reign," asserts *The Northern Miner*, "when large numbers of prospectors comb the woods at will. When the small individual and the junior company are barred from prospecting, the kind of grass roots exploration necessary to find mines languishes"

MINING PROGRESS IN SURINAM

The recovery in world business conditions brought about a perceptible improvement in Surinam's economy, states the Hollondsche Bank-Unie N.V. in its annual report for 1959-60. Exports of bauxite, which by far outranks all other Surinam export commodities and constitutes the mainstay of the national economy, displayed a substantial increase. In the first half of 1960 they totalled 1,805,000 tonnes. Towards the end of 1959 a digging-wheel dredger was put into operation by the Billiton Maatschappij Suriname N.V. This machine removes the exceptionally thick overburden. For the transportation of Billiton's bauxite new ore vessels of larger capacity were used. These new ships, drawing only little water, were specially constructed to suit the shallow fairway in the Surinam river.

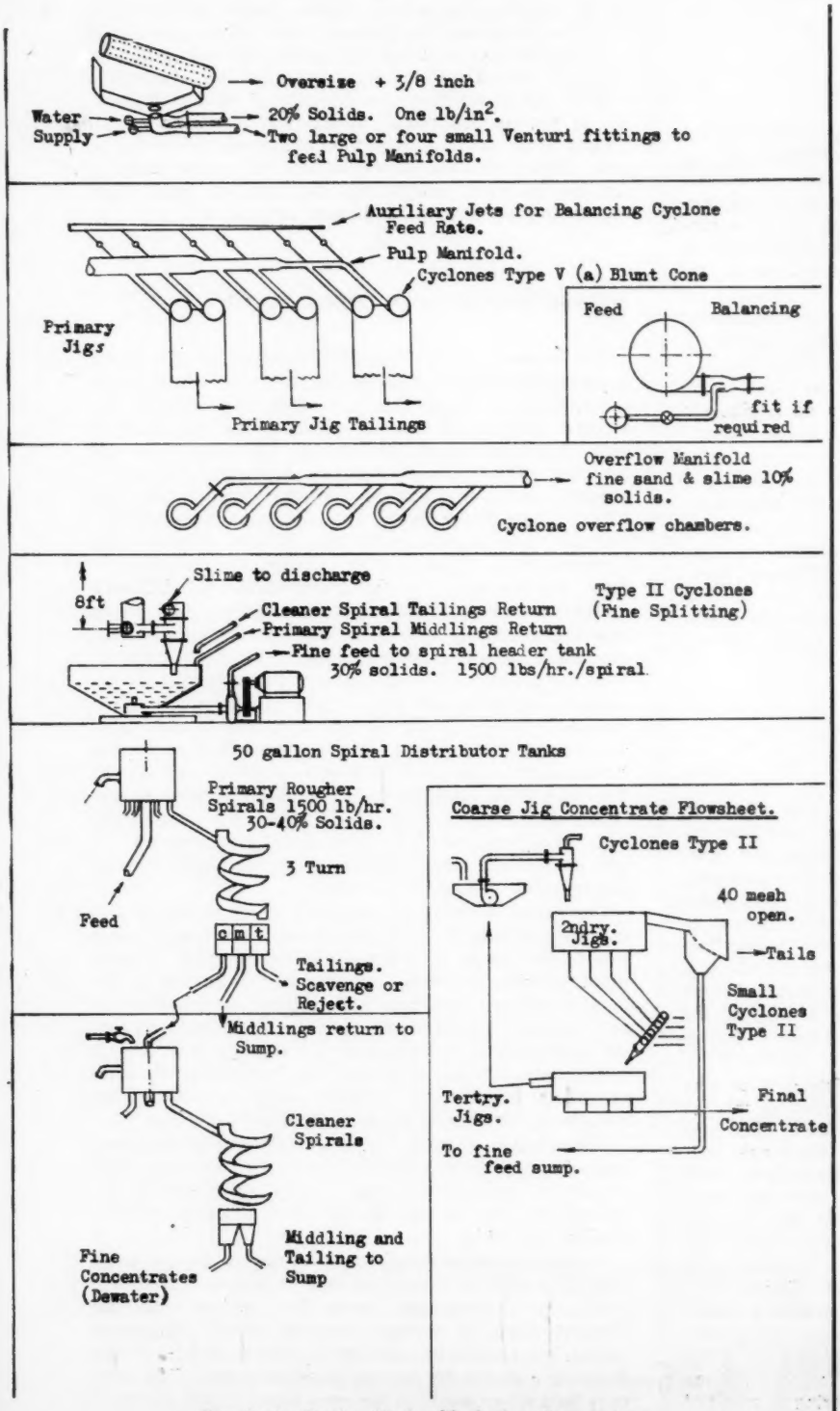
At the government's request, two Dutch professors delivered a report at the end of 1959 on the probable expansive influence on the Surinam economy of the execution of the Brokopondo hydro - electric plan and other simultaneously started development projects, such as the Ten-Year Plan. The report is now being studied by the Dutch authorities. Preparatory activities in connection with the Brokopondo plan have made good progress. It was decided that the financing of another hydro-electric power station should be discussed.

The aerial mapping of Surinam's southern region and the aerogeophysical investigations are also going ahead. Within the scope of "Operation Grasshopper", seven small airfields and basic camps were constructed in the interior, whence geologists will conduct investigations so as to obtain a complete geological and mineralogical survey of the whole of Surinam in a few years. This project is financed partly from the Ten-Year Plan and partly from an amount of about Sf. 1,500,000 made available for the purpose by the Special Fund of the United Nations.

The winning of gold, which showed a good improvement during 1959 in comparison with the very poor 1958 output (181 kg. against 132 kg.) receded again substantially during the first six months of 1960, when production totalled only 58 kg.

Prospecting for petroleum was continued. Experimental drillings were to be carried out near Paramaribo, states the report, and a seisographic survey is to be held under the Nickerie coast. A mining company, chiefly American-owned, has applied for consent to explore an area in the Marowijne district for copper, nickel or cobalt. The company held a concession in the same area for gold prospecting.

A Proposed Dual Cyclone System fo



Flowsheet: Dredge fitted with dual cyclone system

NEWLY developed ultra-low head cyclones are fed with screen undersize pulp diluted with some water from pressure jets. The underflows are treated on the primary jigs on which the cyclones are mounted. The overflows are fed to fine splitting cyclones for desliming and the fine sands thus produced are treated on spirals or jigs.

The system overcomes variable feed conditions, minimizes pumping and wear and provides optimum feed preparation for both fine and coarse cassiterite.

Hydrocyclones of high capacity, capable of desliming low pulp density feeds were developed and demonstrated by the Research Division over the past few years.

A suitable type of jig plant was devised to make use of the cyclones and the system is steadily replacing older methods throughout Malaya, for use in gravel pump mines, and variations of the cyclones in large and small sizes are being used in many different ways.

It is found that a good land based cyclone-jig plant is capable of recovering very fine cassiterite, even a significant amount of minus three hundred mesh B.S. sized mineral being obtained.

Since dredges rarely recover cassiterite finer than 200 mesh B.S. many attempts were made to apply similar cyclones for desliming dredge primary jig feeds. Single stage cycloning was found to be unsatisfactory in cost and performance.

The dredge plant feeds differ from those of the ground based plant in one important respect, namely pulp density. Whereas the pulp density produced from a gravel pump mine averages about 10 per cent solids with a maximum of about 20 per cent solids, the pulp density fed to the dredge primary jigs normally approaches 25 per cent solids by weight, with a maximum of about 40 per cent solids. Total pulp volume flow rates remain fairly constant in both types of plant.

In order to secure a fine sized cyclone overflow from an undiluted dredge pulp it would be necessary to employ small, low capacity cyclones fed at high pressure. Power costs, wear, and installation costs would all be so high as to render the improved recovery uneconomic in most cases.

Malayan Dredges

By

P. M. Sheahan, B.E., A.M.Aust. I.M.M.

Chief Research Officer, Department of Mines, Research Division, Federation of Malaya

On dredges with modern jigs, the cycloning of the feed has shown increases in recovery of not less than 10 per cent and up to (in one instance) 40 per cent. The approach here outlined is the only economical method so far found, despite persistent efforts by the industry, to apply more straightforward cycloning methods, using the cyclones evolved for the gravel pump mining industry. The article is published by permission of the Chief Inspector of Mines, Federation of Malaya, and with the authority of the Minister of Rural Development

A diluted dredge pulp can be cycloned, but the amount of water required to dilute the pulp, to a degree where the recovery of very fine cassiterite would be assured, is quite large, unless recourse is had to large cyclone feed pressures.

To overcome these problems, the Research Division has evolved special cyclones to be used in a two stage cyclone flowsheet. The Dual Cyclone system minimizes pumping and water requirements, and takes advantage of the relatively coarse split obtained by cyclones fed with dense pulps at low pressures.

Special blunt-cone cyclones have been developed which are capable of making an acceptable coarse split on feed heads of three feet or less. The height of the cyclone inlet above the jig bed is minimized because of the flat cone angle and the use of two small diameter units in preference to one large diameter unit, mounted directly over the first compartment of each jig.

The available pressure due to the height of the pulp level in the distributor box above the level of the cyclone inlets is augmented by adding jets of water to force the pulp through a venturi as in the well known hydraulic elevator. Water pressures required are not comparable with those used in the normal hydraulic elevators, since a boost of only one pound square inch in feed pressure is acceptable in this case. The primary cyclone overflows are preferably fed by gavity to fine splitting cyclones placed near deck level.

The proposed system is based on the test work up to date of the individual pieces of equipment on dredges.

The flowsheet shows primary cyclones fed from manifolds, but individual feed pipes have been used on the first dredge to be fitted with ultra low head cyclones, as is also the case with certain dredges using high pressure jet pumps and ordinary cyclones, in experimental installations. The Department of Mines Bulletin No. 6 contains information on the design and application of the various cyclones.

At first sight the number of cyclones required may seem to be excessive, but the aim has been to secure a reliable self balancing operation, requiring minimum adjustment and minimum maintenance and pumping costs. Cyclone life should be greater than that in land based plants. The system is inherently capable of preparing a deslimed feed containing cassiterite as fine as 20 microns.

Modification of a Typical Dredge

The chief modifications and additions required to use this system on a dredge having a circular distributor are as follows :—

(a) Provision of a supply of dilution water of approximately 200 g.p.m. for every 20 cu. yd. per hr. of dredge throughput;

(b) Two small sand pumps for pumping fine concentrates to cleaner circuit;

(c) Removal of sloping feed launders, and the fitting of hydraulic elevator type venturis and jets directly on to the distributor tank;

(d) Alternative methods of feed distribution are first. manifold cyclone header pipes running fore and aft. port and starboard, from individual jet pumps, or secondly, separate small jet pumps and individual feed pipes to pairs of cyclones or to individuals;

(e) Blunt cone, coarse splitting cyclones are mounted on the feed end of the jigs;

(f) Cyclone overflows discharge into manifolds;

(g) Several fine splitting cyclones are mounted over a pump sump at ground level. These cyclones are fed from the overflow manifolds, using the gravity head available;

(h) Slimes from fine splitting cyclones are discharged overboard;

(i) The preferred circuit for treatment of fines on spirals is as shown in the diagram;

(j) Either spirals or jigs may be used for fines recovery.

Estimate Quantities for Single Primary Jig

The following example is based on the sampling of a large dredge near Ipoh, working in average type ground.

Maximum condition, pulp density 46 per cent solids by weight, including slime, pulp volume 1.3 cu. yds. per min. per jig.

Mean condition, pulp density 33.3 per cent solids by weight, pulp volume 1.24 cu. yds. per min.

Now add 200 gall./min. of jet water.

Maximum condition, pulp density 28.5 per cent solids by weight, volume 420 gall./min.

Mean condition, pulp density 20 per cent solids by weight, volume 453 gall./min.

Two ultra low head cyclones of 18 in. internal diameter, operating at feed pressures of just over 1 lb. p.s.i., would serve to handle this feed.

Each underflow orifice could be 4 sq. in. in area, thus giving an underflow pulp density of about 60 per cent to 70 per cent solids with high pulp density feeds, and lower pulp densities of underflow when solids feed rate is lower. A small stream of water is directed on to the underflow to prevent sanding up. The overflow on the two cyclones could be recycloned with a single 15 in. internal diameter cyclone of the fine splitting type, on a gravity head of less than 10 ft.

It will be seen that only water has to be pumped in any large volume. The flows of pulp are relatively constant under a variety of conditions, so that if a suitable capacity of cyclones is installed, their operation can be expected to be relatively stable.

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Research on the Concentration of Columbium Minerals

The extractive and processing problems presented by Canada's extensive resources of columbium minerals have been the subject of intensive research by the Mines Branch and commercial firms. A pilot plant is now being erected by Columbium Mining Products Ltd. in Oka, Quebec. It is claimed that the flowsheet is the most advanced technique yet developed for the concentration of columbium minerals of the Oka type

FINAL mill tests by Columbium Mining Products, carried out at the Mines Branch, Ottawa, on a 150-ton bulk ore sample from its Oka area columbium property, have given highly satisfactory results. Consequently the company, which is a subsidiary of Coulee Lead and Zinc Mines Ltd. and Headway Red Lake Gold Mines Ltd., has started preliminary design of a 250-ton-per-day pilot plant for its property. This work is being done under the direction of Kilborn Engineering Limited, Toronto, and should be completed towards the end of February. The detailed engineering design will then commence.

The mill will produce approximately 750,000 lb. of columbium pentoxide (Cb_2O_5) annually. Purchase agreements were concluded some time ago with W. R. Grace & Co., New York, and Metallgesellschaft A.G., West Germany, as reported in *The Mining Journal*, October 21, 1960.

In the final mill test, the company, using its patented flotation process, produced concentrates grading 45 per cent to 48 per cent columbium pentoxide with an overall recovery of approximately 85 per cent. The 150-ton bulk sample averaged 0.4 per cent Cb_2O_5 per ton, so the ratio of concentration was better than 100 to 1.

Columbium Mining is particularly pleased with its flowsheet, for officials believe it to be the most advanced technique yet developed for the physical concentration of columbium minerals of the Oka type—the predominate one being the mineral pyrochlore. The process also recovers betafite, niocalite and perovskite, all of which carry columbium.

In the process, ore is put through a preliminary float, which conditions the pulp for subsequent steps and along with magnetic separation, eliminates 4 per cent of the feed as waste. In the next stages, primary, secondary and tertiary floats about 95.2 per cent of the feed is rejected as waste. The remaining fraction is treated by tabling to produce a 48 per cent columbium pentoxide material. Fine columbium-bearing particles in the table reject are recovered in another float, producing a final concentrate of at least 45 per cent Cb_2O_5.

In brief, over 99 per cent of the feed has been eliminated as waste by the employment of a technique which is based on selective flotation of columbium minerals and one tabling step. An important factor about the flowsheet is that after the primary float, tailings can be returned to any point in the circuit for additional recovery without any retreatment. Average tailings' loss in the tests was 0.04 per cent Cb_2O_5 per ton. There is a good possibility of reducing this by one half under actual operating conditions.

Previous diamond drilling, about 35,000 ft., on the property which lies 25 miles west of Montreal, Quebec, indicated 106,000,000 tons containing 5.0 lb. of Cb_2O_5 per ton in approximately one fifth of the potential zone. This tonnage includes an estimated 38,000,000 tons averaging about 8.0 lb. Cb_2O_5 per ton.

Meanwhile, the company continues to carry out a close interval grid drilling programme along this orebody to determine open pit limits as well as delineate zones of various grades. To date, about 10,000 feet of grid drilling at 80 ft. intervals has been completed to a depth of 200 ft. Using a cut-off grade of 0.5 per cent Cb_2O_5 approximately 9,000 tons per vertical foot has been indicated and will be extended by further holes. Horizontal widths range from 90 to 350 ft., thereby making low cost open cut mining feasible.

In addition, Columbium Mining is conducting a number of processing programmes on the concentrate at Ottawa. These involve treatment by chloridization, production of metal, sulphuric acid leaching and hydrolysis, and production of ferro-columbium. This work is primarily designed to evaluate and derive process data on the Columbium Mining concentrate for the information of potential consumers.

The possibilities of obtaining important by-products from the mining operation are not being overlooked. Preliminary research has indicated that a Portland cement product may be derived from the carbonate tailing. A good apatite concentrate has also been obtained by flotation.

The deposit also carries thorium, uranium, rare earths and magnetite but it is not known yet if these will constitute economic by-products. The possibilities will be investigated in due course.

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	HALIFAX	MONTREAL	NEW YORK	BOSTON
ADEN (S)	5,970	6,492	6,513	6,320
ANTWERP	2,795	3,281	3,281	3,157
BORDEAUX	2,647	3,169	3,279	3,016
BRISTOL	2,462	2,977	3,006	2,831
BUENOS AIRES	5,710	6,423	5,860	5,810
CALCUTTA (S)	9,260	9,810	9,823	9,632
CAPETOWN	6,456	7,156	6,805	6,776
CHERBOURG	2,530	2,995	3,098	2,915
COLOMBO (S)	8,073	8,596	8,606	8,412
GENOA	3,518	4,021	4,036	3,858
GIBRALTAR	2,673	3,195	3,206	3,015
HAMBURG	3,117	3,573	3,717	3,554
HONG KONG (S)	11,045	11,578	11,584	11,400
LIVERPOOL	2,502	2,760	3,070	2,896
LONDON	2,719	3,241	3,270	3,088
MONTEVIDEO	5,590	6,323	5,746	5,700
PERNAMBUCO	3,546	4,270	3,692	3,650
RIO DE JANEIRO	4,638	5,358	4,790	4,740
ROTTERDAM	2,854	3,310	3,454	3,291
SINGAPORE (S)	9,600	10,140	10,150	9,959

Legend: (S)=via Suez

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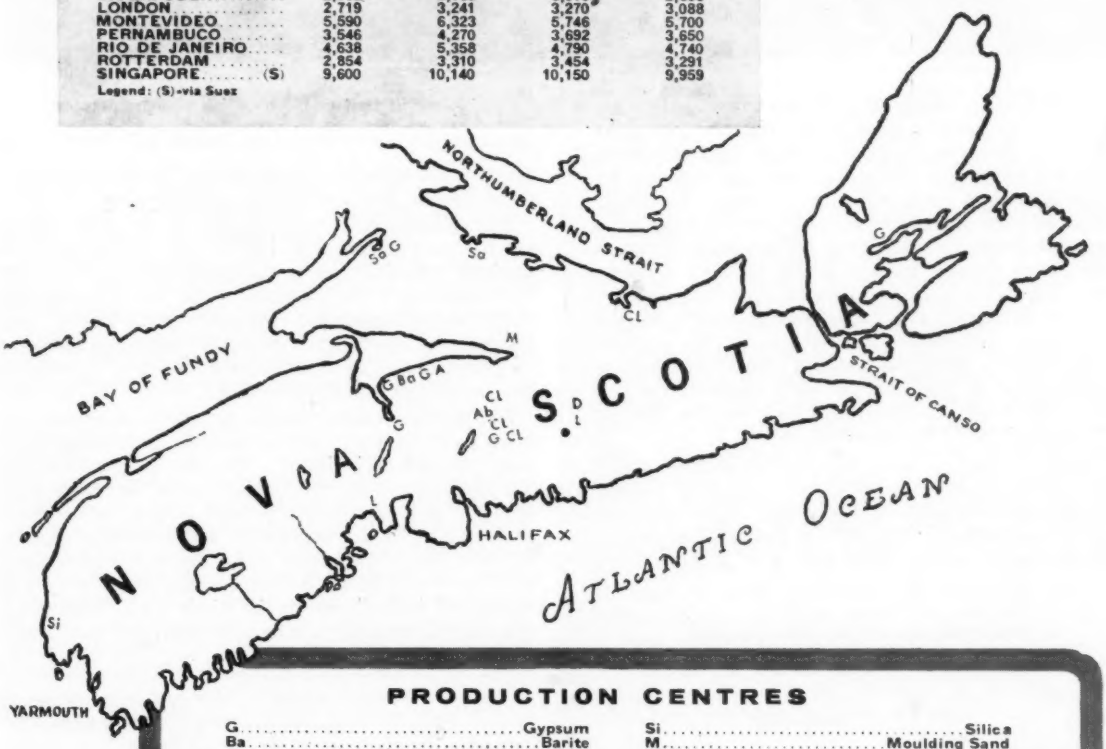

PRODUCTION CENTRES

G	Gypsum	Si	Silica
Ba	Barite	M	Moulding Sand
Sa	Salt	Ab	Abrasive Sand
L	Limestone	A	Anhydrite
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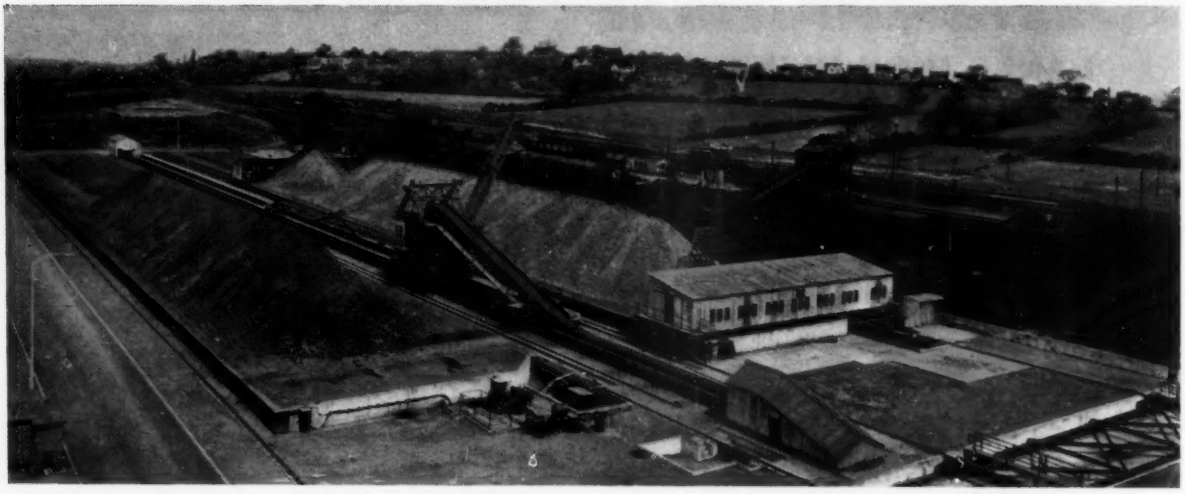
Blending Iron Ore at Stanton



General view of the blending plant at Stanton

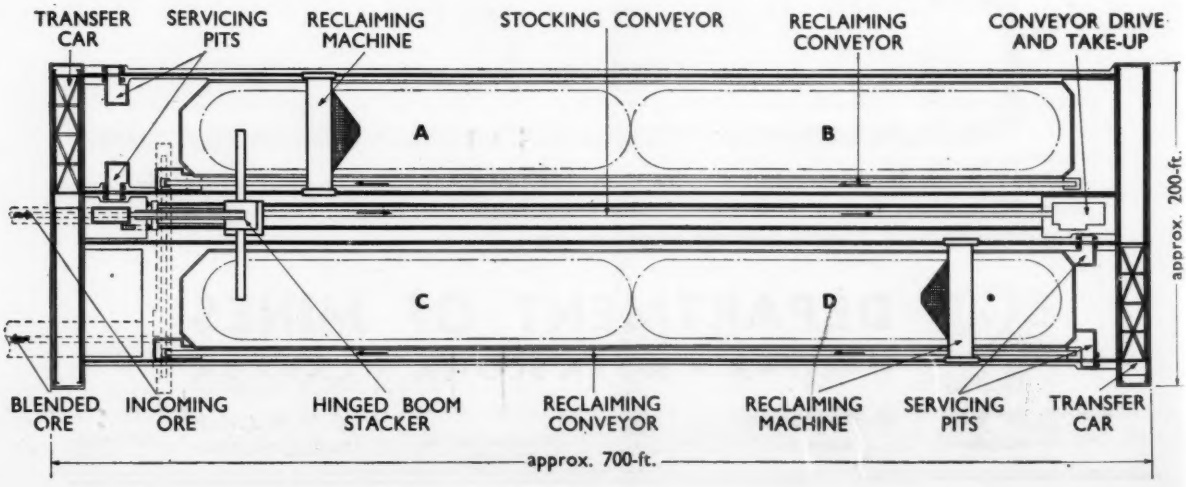
AS part of an overall plan for modernizing their pig iron production plant, The Stanton Ironworks Ltd. completed in 1959 a comprehensive scheme for blending all their incoming iron ores and sintering the fines before sending them to the blast furnaces. Previously the furnaces were charged with run-of-mine ore delivered direct to the furnace bunkers from railway wagons, but as the ores were coming from a dozen or more different sources, both in the U.K. and abroad, it became essential for them to be blended to obtain a blast furnace burden of even chemical composition. Accordingly, an ore preparation and sintering plant was installed capable of handling the 35,000 tons of iron ore per week required for full capacity. This plant was described in the summer issue of *G.E.C. Journal* by J. W. Harwood.

In the ore preparation plant the incoming iron ore is first crushed to 2½ in. and the whole of it is then blended in a Robins-Messiter type of installation. After blending, the ore is screened on two parallel lines of gas-heated single-deck Gyrex screens fitted with ½ in. x 2 in. mesh. The oversize is sent direct to the blast furnace bunkers, but the undersize goes first to the sintering plant.

The crushing plant was supplied by Mitchell Engineering Ltd. and includes two 5½ ft. Symons standard cone crushers manufactured at the Erith Works of the G.E.C. The latter were the contractors for the blending plant, which was designed and manufactured at Erith. Moxey Ltd. were contractors for the main conveying and screening plants, which incorporate four 6 ft. x 14 ft. screens of the Gyrex type, supplied by G.E.C.

The Robins-Messiter blending system comprises one or more pairs of long and comparatively narrow stocking beds arranged as indicated. The ore is deposited on one bed of a pair from a travelling stacker served by a long conveyor belt. The stacker has two hinged booms, one for each bed. It moves backwards and forwards, depositing ore from one of the booms down the middle of a bed. In this way a pile of ore is built up in a succession of thin layers until it finally covers the whole area. When the pile is complete, stacking is started on the other bed, and the

General arrangement of the blending plant



Robins-Messiter reclaiming machine in operation on an ore pile

finished pile is retrieved by a reclaiming machine, which, starting at one end, removes successive slices across the full section of the stacked pile while moving slowly forward. The dislodged material falls into a plough conveyor at the base of the reclaimer and is scraped sideways on to a belt conveyor which takes it out of the blending plant.

Each reclaimed slice is composed of a mixture of all the layers that have gone into the composition of one pile, and thus the system is, in effect, a continuous sampling process. Ores varying in iron content by as much as ± 15 per cent from the average can be blended by this method to a mixture for smelting which is constant within ± 1.5 per cent.

The blending plant consists of a single pair of stocking beds situated 4 ft. 6in. above ground level. In previous designs the beds were on the ground and the reclaiming conveyor belts ran in troughs alongside them. The raised-bed type of plant was developed by the Erith Works in order to save the cost and complication of placing the conveyors underground and to simplify their maintenance by making access to them much easier.

Each of the beds at Stanton Ironworks can hold up to 15,000 tons of iron ore in a pile of triangular cross-section 21 ft. 6 in. high and 56 ft. wide at the base. The ore comes in from the crushing plant on a 42 in. stocking conveyor belt running between the beds to the hinged-boom stacker, which deposits it on the pile that is being built up. The stacker has a capacity of 600 tons of ore per hour and normally runs for two shifts per day during the period when the crushers are in operation.

The plant is equipped with two reclaiming machines, which are set down at opposite ends of the beds facing each other. Only one of them is employed at a time in discharging a finished pile, the other being in reserve. Their capacity at 300 tons per hour each is smaller than that of the boom stacker, but they operate over 24 hours.

Hinged Boom Stacker

The stacker moves on a rail track at ground level between the two beds and receives the crushed ore from the stocking conveyor belt, which is fed from an underground conveyor at the end of the plant. The stocking conveyor runs between the two beds for their whole length, but, on reaching the stacker, it passes up a trailing bridge at the rear end, and turns over a pulley at the top, discharging the ore on to a short reversible conveyor belt. The stocking belt then descends to a bend pulley at the base of the structure and continues between the beds to the far end, where it passes round tandem drive pulleys, by which it is powered, and thence back to the feed end.

The stacker has two booms, each carrying a conveyor belt, and the reversible conveyor delivers the ore on to whichever boom is being used. A single 40 h.p. motor is provided for the boom conveyors, clutches being fitted to connect it to the belt in use. The reversible conveyor is driven by its own 5 h.p. motor. The booms, hinged at the bottom, are held in position by wire ropes, each connected to its own motor winch which allow them to be adjusted from 8 deg. below to 18 above the horizontal position. Height regulation is of considerable importance when the weather is dry, as dust generation can be reduced to a minimum by keeping the discharge point close to the top of the pile.

Hinged boom stacker, showing the trailing bridge for stocking conveyor

The stacker picks up its power from lines of conductors secured to the side wall of one bed and protected by an overhanging lip. It is driven at a speed of 50 ft./min. alternately forward and backward along the pile.

Reclaiming Machines

The reclaiming machines at opposite ends of the piles on the further bed, are Robins-Messiter machines of Mark III design for use in conjunction with raised stocking beds. A reclaimer consists essentially of a bridge structure on rails which spans the bed and the outgoing conveyor alongside it. It is mounted on six track wheels, two driven and one trailing on each side. The rails are on ground level on both sides of the beds.

When reclaiming, the machine is driven slowly forward by a 15 h.p. motor with a variable-speed gear, placed roughly at the centre of the span, which rotates a lineshaft extending for the full length of the bridge.

As the reclaimer moves forward into the pile, the oscillating teeth of the harrow mounted in front of the cabin dislodge the ore evenly over the whole of the face so that it falls into the trough of the plough conveyor at bed level. The trough extends for the full width of the bed and projects over the reclaiming conveyor. The plough consists of manganese-steel flights secured to a heavy chain of special design which passes round a sprocket wheel at each end. Both top and bottom strands of the assembly slide on guides. The lower flights, which plough the ore sideways on to the reclaiming belt, move just clear of the bottom of the trough; the upper return strand is behind the harrow away from the ore.

Although the Robins-Messiter system was first used for blending copper ore, the majority of the plants erected since then have been supplied to steelworks.

MINING MISCELLANY

Wabush Iron Co. are undertaking preparatory work costing about £20,000,000 to bring their iron ore deposits into production at Wabush Lake, Labrador. The company is to spend £15,000,000 on dredging a harbour, building an ore dock and 25 miles of railway to connect with the existing Quebec North Shore and Labrador railway running between Schefferville and Seven Islands, some 350 miles downstream from Montreal. Building work includes £5,000,000 on housing and other structures at Wabush Lake.

★

A new mining law, recently enacted in Indonesia, severely limits the participation of private enterprises in new mining operations. Existing private mining rights are to remain valid "for the shortest possible time," to be determined by Government Ordinance. A second new act dealing with the production of mineral oil and gas was also to come into effect on January 1 last; under it all exploitation rights are to be held by the government and mining operations carried out by State Enterprises. Provision is made, however, for the holders of existing mining rights, and others, to be appointed as "contractors" to the State Enterprises. Precise information as to the conditions under which such contracts would be offered is not, so far, available.

★

The Export - Import Bank is authorizing $13,000,000 credit for Marinduque Iron Mines Agents, Inc., of Manila to cover costs of U.S. equipment for an integrated copper and zinc extracting and fabricating plant on Mindanao, in the Philippines. Total cost of the Marinduque project is over $23,000,000. The proposed plant will treat 75,000 tonnes of copper concentrate annually, to produce 14,000 tonnes of copper and copper products. An annual recovery of 5,000 tons of electrolytic zinc is expected, with 98,000 tons of ammonium sulphate as a by-product.

★

Uranium is reported to have been discovered by French and Persian geologists working for a Persian mining company in Persian Azerbaijan, near the Russo-Persian border.

★

Plans for the processing of iron ore mined in the Dieulouard region of France by Société des Mines de Saizerais are to be erected by a new company, Société pour le Traitement du Minerais de Saizerais. The new company, has a capital of N.F. 900,000, 68 per cent of which is held by Société des Fonderies de Pont-a-Mousson, and 32 per cent by Société des Acieries de Pompey, the two companies which own Société des Mines de Saizerais. The processing facilities will increase the Dieulouard deposit's annual production from 700,000 tonnes to 2,000,000 tonnes. The ore concentration unit and processing works will cost N.F. 20,000,000 partly provided by the High Authority of the European Coal and Steel Community and partly by French finance. The processed ore will be used in blast furnaces owned by the two parent companies.

A new materials handling system will be installed shortly at Kennecott Copper Corporation's copper smelter at Garfield, Utah, U.S. and, together with other changes will cost about $5,000,000. When completed, the new system will provide for the copper bearing concentrates to be fed directly to the reverberatory furnaces. This will eliminate the present roasting process and reduce the times needed to convert the concentrates into copper anodes. This project is the first step in a long term rehabilitation of the entire smelter, which Kennecott bought in 1959 and part of which dates from 1906.

★

A tender has been issued for "mineral ore loaders, three 6-ton capacity, diesel-powered, hydraulic loading shovel, estimated value $U.S.55,517, bid deposit 2.5 per cent" by February 22, by Armazens Gerais, Direccao dos Portos, Caminhos de Ferro e Transportes, Lourenco Marques, Mozambique.

★

Recent figures show Italy's 1960 primary aluminium production at some 83,000 tonnes, to be 10 per cent above the figure of 74,910 tonnes in 1959. Other provisional output figures show rises of 20 per cent, from 4,500 tonnes to 5,500 tonnes for magnesium; 8 per cent, from 73,658 tonnes to 80,000 tonnes for zinc; 20 per cent, from 8,985 tonnes to 11,000 tonnes for silicon; 8 per cent, from 250 tonnes to 270 tonnes for cadmium; and 30 per cent, from 263 tonnes to 400 tonnes for antimony. There were also increases in production for other minor metals, but lead output was down by 3 per cent, from 44,390 tonnes to 43,000 tonnes, and silver, down by 28 per cent, from 39 tonnes to 25 tonnes.

A programme of investigation, surveying and mapping of trap rock deposits on a chain of islands in the North Channel of Lake Huron, Ontario, for Poly Ores Mining Co. and Tough-Rock Quarries, which has been carried out by Hopkins Mining Consultants, has shown that the ore is basalt, diorite or diabase, and all the deposits to be mined have adjacent 40-ft. water depths, suitable for the largest ore-carriers on the Great Lakes. The initial open pit is now being designed for a production of 10,000 tons of H.L.1. aggregate per day. Production from another island is reported to be possibly as high as 80,000 t.p.d. Mining is planned to use 60-ft. benches, and the latest electronically-controlled equipment.

★

The U.S. Bureau of Mines has announced that the 1,100,000 workers in the U.S mineral industries achieved a new work safety record in 1959. Fatal injuries and cases of total disability declined 10 per cent, from 30 per 100,000,000 man-hours in 1958 to 27, in 1959. Total injuries declined to 17.51 per million man-hours of exposure, a reduction of 4.7 per 1,000,000 man-hours on the 1958 rate.

★

Work has begun on dismantling the N.C.B.'s five-year-old boring tower at Inverkeithing, which was used during the new Seafield sinking on the Fife coast. The estimated overall expenditure on the drilling project was £150,000, but the tower uncovered a major fault in the seams, without which information two tunnels costing about £500,000, would have been wrongly sited.

Continued on page 157

In the U.S. Braen Industries, Inc., working a quarry near Riverdale, N.J., use a P & H Model 1025 power shovel manufactured by Harnischfeger Corp. of Milwaukee. Braen uses another P & H shovel plus 40 and 60-ton capacity Harnischfeger truck cranes. Moved by P & H shovels to 30-ton dump trunks, the granite passes through crushers, size screeners and washers, prior to distribution

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The results of Operation Overthrust, claimed to be the largest geological compilation of its kind, recently undertaken by Hunting Survey Corporation, and now available in single sheet form. Operation Overthrust covers some 372,00 sq. miles of the Precambrian Shield in Canada, and an adjoining part of the U.S. It consists of 500 individual photo mosaic sheets, each cover an area of 720 sq. miles. These sheets are now available singly, together with their overlays showing all geological data and pertinent geophysical interpretation at a cost which averages 72 c. per sq. mile. Hunting Survey Corporation, of 1450 O'Connor Drive, Toronto 16, Canada, will supply details on request.

★

It is reported from Libreville in Gaboon that preparatory work is progressing on the uranium deposits of Mounana and the manganese reserves of Mouanda, both near Franceville. Exploitation of uranium is expected to start in July next, and of manganese in mid-1962.

★

The Humboldt works of Klöckner-Humboldt-Deutz AG of Cologne, Western Germany, have received a large-scale order from Italy for planning and erecting an electrode processing unit for the aluminium industry. A similar plant is currently being constructed in Venezuela.

★

A new lead-zinc mine at Kisnica in Yugoslavia is to start production soon with an anticipated annual output of 150,000 tonnes of ore, to supply the Trepca metals combine.

★

The French ferrous metals company, Lorraine-Escaut reports an increase of 8.3 per cent in iron ore production during 1960, compared with the previous year.

★

The U.S. Office of Minerals Exploration is asking for a budget of $1,100,000 for operations in 1962, double the 1961 appropriation. Of this amount, $800,000 is earmarked for loans to aid private industry in exploration for strategic and critical minerals.

★

The U.S. Business and Defence Services Administration reports that, unless there is a marked increase in coal and steel production, 1961 shipments of mining machinery will approximate the 1960 levels, which were estimated at about 12 per cent of total shipments, the same as in 1959. Prices are reported to have remained mainly steady.

★

A contract, renewable annually, has been concluded between the Siderurgia Nacional, and Ferrominas, in Portugal, under which Siderurgia will get 60,000 tonnes of iron ore from the Moncorvo mines of Ferrominas during 1960.

★

Large deposits of perlite have been located and are now being exploited in various areas of Bulgaria. Plants with an aggregate capacity of 57,000 cu. m. are to be completed at Kurdjali, Rousse, Varna and Bourgas during the first half of this year, and one at Sofia by the end of the year.

Personal

Holman Brothers announce that Mr. James Ritchie was appointed financial director with effect from February 1. Two Holman associate directors, Mr. J. L. Ritchie (sales director) and Mr. J. M. Williams (London director) were also appointed directors of Holman Brothers from the same date.

★

Mr. Conrad W. Thomas, mineral industries consultant, has opened an office at Via F. D. Guerrazzi 1D, Rome, Italy, for mineral investigations in Europe, Africa and the Middle East.

★

Mr. W. A. McClunie, headquarters tunnelling engineer with the N.C.B., has been giving talks to technical representatives of Atlas Copco (G.B.), at a refresher course at this company's head office at Hemel Hempstead.

★

The American Institute of Mining, Metallurgical and Petroleum Engineers, Inc., has elected to honorary membership: Dr. Rene V. M. Perrin, the Ugine authority, of Paris; Mr. Carl E. Reistle, Jr. vice-president of Humble Oil and Refining Co., and a former AIME president; and Dr. J. F. Thompson, honorary chairman of INCO.

★

Mr. J. L. Ritchie, sales director of the Holman Group, is touring eight countries in South America, to visit Holman agents and technical representatives.

Sir John Wrightson, Bt., chairman of Head Wrightson & Co., will visit the Durgapur Steelworks during his stay in India; he will also be present when the new company, Head Wrightson India, officially commence operations in Calcutta.

★

Mr. Robert Blair, a Johannesburg consulting mechanical engineer, on the staff of the Anglo American Corporation, has won a world award sponsored by a U.S. mining magazine for technical developments contributed to the international mining industry.

★

Harnischfeger Corporation announce that Mr. W. S. Burdick has resigned as vice-president of engineering, and assumed position of corporate consulting engineer, and Mr. Bernard Pratte has been elected to be assistant to the president.

★

M. Marcel de Merre has become the new president of the Belgian non-ferrous metals firm, Société Générale Métallurgique de Hoboken, and M. Richard Terwange will be managing director. These appointments have been made following the resignation of president, M. Gaston Blaise and managing director M. Edgar Senglier.

★

American Exploration and Mining Co. announce the appointment of Mr. H. B. James as secretary-treasurer and director of the company, a wholly owned subsidiary of Placer Development, on the retirement of Mr. D. de S. Duke, who has served the company for 27 years.

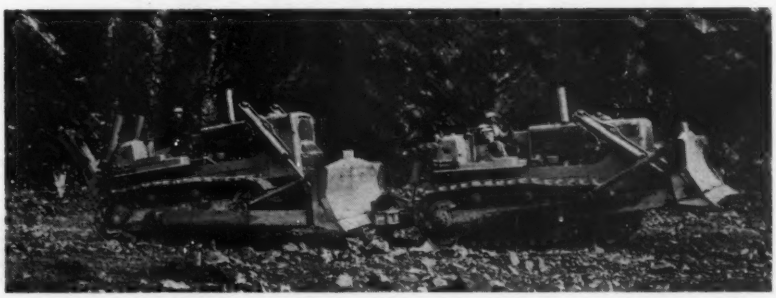
Demonstration of Ripping

A demonstration of rock ripping at the Merehead quarry of Foster Yeoman Ltd. was organized recently by Bowmaker (Plant) Ltd., Caterpillar Tractor dealers in the West Country, Midlands and Wales.

The machines demonstrated were two power shift D9 tractors fitted with hydraulically operated bulldozers and Caterpillar and Kelley hydraulic rippers. The application was ripping in bed rock and it was the first time in this country that tandem ripping had been demonstrated to the quarry industry.

Bowmaker (Plant) Ltd. have pioneered this work using carefully applied methods of testing, surveying and costing. Three years ago, the Caterpillar Tractor Co. introduced the refraction seismograph to measure the overall consolidation of subsurface materials. The seismic waves travel through subsurface materials at varying velocities, depending on their degree of consolidation. They can vary from 20,000 ft./sec. in a tight hard rock formation to less than 1,000 ft./sec. in a loose loamy soil. Thus the seismograph can indicate whether the formation can be ripped, the equipment which will be required, and the production which can be obtained.

When ripping, the tractor lowers the ripper into the rock to the depth it is able to maintain in the hardest areas. The tooth is lifted clear, the tractor turns, starts another run until the area has been ripped and then repeats the process. The ripped rock is either dozed over the face, dozed to stock, or picked up direct by traxcavator or scraper. A three-inch pad of ripped material should be left in order to provide traction on the next ripping phase and to cushion the tractor.



Machinery and Equipment

Stowage By Compressor

In recent years there has been a great deal of activity investigating the advantages of power stowing in coal mines. In designing a compressor supplying air to the actual stower there are some special considerations.

If air is used from the air main in the mine, there is a terrific wastage of power as it is necessary to reduce the pressure from, say 80 p.s.i.g. to 15 p.s.i.g. On a unit of this sort which requires something like 2,000 cu. ft. per min. this represents a wastage in horsepower of approximately 250 to 300 per cent—there are, of course, also many mines where air in these quantities is simply not available.

The operating pressure at which stowing will take place will vary considerably from strata to strata. If the material is dense, it will require high operating pressure to carry it. If it is light, it can be carried at a comparatively low pressure. The requirement may vary from say 10 to 20 p.s.i.g. The machine used to supply the compressed air must, therefore, have a variable compression ratio in order that air be supplied at just the correct pressure to carry the material. If a machine with a fixed compression ratio is used, it is either limited in its application, or part of the time it will be operating uneconomically if designed for the upper pressure limit.

The compressor must be started and stopped easily by remote control if necessary. It must have a relatively low starting torque and should be capable of running light, as it is likely that the stowing operation will be started and stopped frequently and if the motor was switched on and off the starting panel contactors would erode rapidly. The machine should also be designed so that the power requirements when running light, are an absolute minimum as the time is likely to be a fairly high proportion.

Width is probably the most critical of all the dimensions as, of course, the machine must be suitable for going down a shaft and still have access alongside for the conveyor to carry the slag to the crusher or stower. There must also be access for maintenance round the machine.

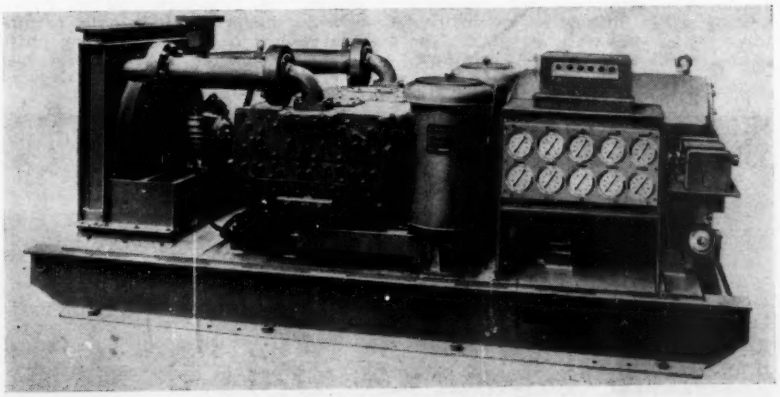
Due to the principle of the power stowing method, it is imperative that all equipment be semi-portable to allow a gradual withdrawal from the face as the operation progresses. At the same time the compressor must be rugged and simple.

A machine which is claimed to conform to these demanding specifications is the Tilghman 4-cylinder horizontally opposed reciprocating machine. It has four 11½ in. dia. cylinders and is of the single acting trunk piston type. It has a stroke of 5½ in. and operates at 1,000 r.p.m. It has an infinitely variable compression ratio and will compress only to the desired operating pressure. Thus considerable power is saved.

The machine is described as being both simple to start and having a low starting torque. After starting, the current falls to normal in approximately 5 to 7 sec. It can easily be unloaded for running light, as the governor operates claw plungers which hold the suction valves open thus preventing compression. With this type of unloading the light load h.p. is only about 10 per cent of the full load power which can show vast savings over some machines which require as much as 50 per cent power even when running light. The reciprocating compressor is inherently quiet running but nevertheless the manufacturers have incorporated a combined silencer and inlet filter to reduce the noise level even further.

The compressor is of the horizontal (balanced-opposed) reciprocating type, trunk piston, single stage design and is composed of four cylinders in two banks of two, each opposing the other about the crankshaft centre line. The cranks are so arranged that opposite (i.e. opposing) cylinders are either at top dead centre or bottom dead centre together. The machine is totally enclosed.

The Tilghman 4-cylinder horizontally opposed reciprocating compressor



CROMPTON PARKINSON LTD. IN 1960

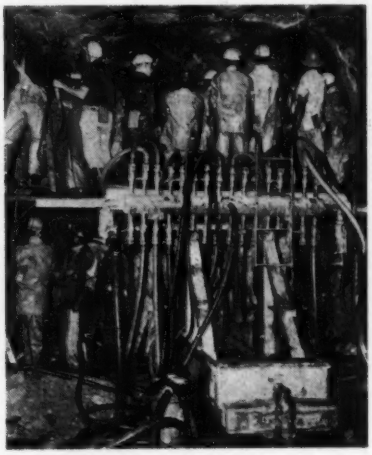
Expansion was the order of the day at the Derby Cable Works of Crompton Parkinson Ltd. during 1960, and to cater for the considerably increased demand for flexible conductors for the N.C.B. and other customers, it was found necessary to increase capacity.

During the year the company acquired in Australia complete control of the Noyes organization. This is now entirely responsible for the distribution and sale of C.P. products in Australia. The Noyes Co., founded in 1888, is, in addition to its responsibilities for the sale of C.P. goods, an engineering and merchanting company with widespread connections throughout Australia, distributing and installing a wide variety of engineering products produced both in Europe and the United States, as well as in Australia.

Mention of two interesting contracts completed during the year gives some indication of the diverse interests of the company's selling organization in Australia—interests covering heavy industry, mining and supply authorities.

One of these was a contract with Australian Iron and Steel Ltd. for the supply and installation of a complete slope haulage, with a capacity of 41 tons, for the transporting of men and material. The 12 ft. dia. x 6 ft. single drum winder of this equipment will operate in a 6,300 ft. drift, the main incline being a 1 in 4 grade. The Ward Leonard drive is controlled by radio from the car.

Also of interest was a contract for the supply of transformers, switchgear, instruments, motors and control equipment to the Electrolytic Refining and Smelting Co. of Australia Pty. Ltd. This equipment was required for a new continuous copper casting furnace—the first of its type in the Southern Hemisphere.



Holman HA 300 Handrils and Airlegs in a 14 ft. by 14 ft. high speed haulageway

HARD ROCK TUNNELLING AT NCHANGA

In terms of hard rock excavating the performance of Nchanga Consolidated Copper Mines on the Northern Rhodesian Copperbelt last July bids fair to being a world record. During a 26 day period in that month, and with an average daily advance of 47 ft. 8,889 cu. yds. of rock were excavated from a new 14 ft. square haulageway.

Operations were organized in six hourly shifts and the best performance achieved during July was two complete

The Atlas Copco T2G Loader. Operations at Kiruna delimit its potentialities

cycles in one shift. Drilling was done with 18 Holman H.A. 300 Handrils of which 11 were in use and 7 kept as spares, with a similar number of 2½ in. bore Holman airlegs, having a piston stroke of 52 in. Tungsten carbide chisel bit integral hexagon 1 in. steels were used. The handrils, operated at an air pressure of 100 p.s.i. were used to drill an 8 ft. 9 in. round.

A five hole burn cut was used and five to six rounds were drilled every 24 hours. Each round was cleaned in one operation using a locally designed and constructed conveyor system which allowed broken rock to be mucked on to a train of six 25 ton Gregg cars, with the need for shunting operations eliminated.

RUBBER-TYRED AUTOLOADERS

Time and motion studies undertaken at the Kiruna mine in Northern Sweden, have served to delimit the potentialities of the Atlas Copco T2G and T4G rubber-tyred autoloaders. Over 6 hr. operating periods respective outputs have averaged 110 tons and 150 tons with a one-way haulage distance of 160 ft. and rock weighing 2 tons/cu. yd.

Autoloaders have been found particularly useful at Kiruna in the construction of insets during shaft sinking and in other excavations too small in size or having too many ramifications for the normal cost advantages of trackbound equipment to be realized.

In this country, the N.C.B. are turning the flexibility of a T2G to advantage for feeding a pneumatic stower with development waste directly from an advanced heading. The waste is loaded and transported by the T2G to a small in-bye crusher whence it is conveyed to the stowing installation.

★

The Emborough Stone Co. of Emborough, Somerset, has reported that one of its air compressors, an Atlas Copco PK-8, this month starts its thirty-seventh year of service in the company's quarry. Installed in January, 1925, the PK-8 supplies all the compressed air needed for drilling in the quarry, and in addition, powers the fuel oil burners on the tar plant. During its service it has never had a major breakdown.

Equipment Digest

A new 25-ton Lorain Moto-Crane, Model MC-325 has been announced by The Thew Shovel Co., United States. This is the latest addition to the Lorain line of rubber tyre cranes that ranges from 7 to 80 ton lifting capacity. There are several distinctive features. One is the new full circle visibility cab used for the first time on a Moto-Crane. By a unique flip top roof design, walk around accessibility is provided. Another is Power-Set Outriggers, as standard equipment, that can be set from travel to working position in about a minute. And there is Lorain's Shear-Ball turntable connection that supports and rotates the turntable on a full circle of steel balls and eliminates adjustment, maintenance and lubrication problems. These last two features have never before been used on Moto-Cranes under 30-ton capacity.

★

R. A. Davies (Midlands) Ltd. have ordered seven Aveling-Barford 400 b.h.p. SN 30-ton Dumpers, valued at over £100,000, for their opencast mining operations near Tamworth, Staffs. Amongst other British users of the SN are several of the big steel manufacturers such as United Steel Companies, John Lysaghts and Richard Thomas and Baldwin; the National Coal Board; and contractors Lomount Construction Ltd. Machines are also operating in several overseas countries.

★

The use of a Simplex Centre Hole Jack, manufactured by The Equipment and Engineering Co. Ltd., can prove valuable for heavy duty pulling, pushing, extracting, stressing or tensioning. Considerable loads can be exerted without torque and with less rigging, a pull rod often being the only requirement. Some typical applications are pre-stressing and post-tensioning concrete; tensioning cables and ropes such as for aerial ropeways and suspension bridges; testing embedded bolts; removing pins from crawler tractors; inserting and removing cylinder liners; and removing and replacing large gear wheels, couplings, roller bearings, bushes, etc.

Standard production models have capacities up to 100 tons with plunger travel up to 22 in. and there are other models up to 300 tons.

Progress in British Instrument Design

The British scientific instrument industry is quietly making many considerable advances in the development of new instruments, many of which are unique in themselves. These instruments, together with others, have reached a continually expanding export market which it is expected will continue for several years to come. Many of these instruments are also the tools for automation which cannot be achieved without them.

The instruments developed and manufactured by member firms of the Scientific Instrument Manufacturers' Association of Great Britain, are of three categories. The first consists of instruments used as components in large-scale operations. The second, laboratory instruments to increase the quality of the product and thirdly, the larger instruments for use in the plant or on machines to give direct automatic control.

The heart of much of the modern instrumentation in the control field is the use of transistors. Many firms have recently brought out important accessories using these devices. Dawe Instruments, Ltd., have developed a transistor vibration meter for the rapid location and measurement of vibration in machines and structures. The world's first completely transistorized oscilloscope has been put into production by Microcell Ltd.

Transistorized time or frequency counters have been developed by Advance Components Ltd., and Racal Instruments, Ltd., the former using six decade meters and the latter an "in-line" projector display. These instruments set a new standard in reliability and ruggedness which is so essential in many overseas countries.

A general purpose versatile decade pulse generator, which generates single or double rectangular pulses for the accurate determination of transmission characteristics and transient responses of amplifiers and networks and for the testing of the frequency and amplitude limits of electronic counters was introduced by the Solartron Electronic Group Ltd.

In the laboratory instrument field there is the zone melting apparatus of Baird & Tatlock (London) Ltd., in association with the Electrothermal Engineering Co. Ltd. It is applied to vacuum zone refining, to soldering, to the sintering of alloys and to sample heating.

C. F. Casella & Co. Ltd. have developed a long period dust sampler in connection with the National Coal Board, so that continuous sampling can take place over an eight-hour working shift for example, and can also be used to assess the dust hazard in various other industries.

The new sub-microchemical balance of L. Oertling Ltd., will weight to a tenth of a million of a gramme, using the torque applied to a quartz fibre beam as the means of achieving a balance.

The measuring magnifier of W. Ottway & Co. Ltd. accurately measures prints on photogrammetric records and has world-wide uses.

A new high sensitivity, low background, Geiger counter is marketed by Panax Equipment, Ltd.

In the industrial field again, Hilger & Watts, Ltd., have the Polyvac-12 vacuum spectrograph for the automatic determination of eleven common additives to steel. For example, the German firm of Phoenix-Rheinrohr A.G., of Duisberg, by using the Hilger Polyprint-30 and the Polyvac-12, analyse 600 samples a day, and make 5,000 measurements of concentration. These instruments in a few minutes do what would take hours of a chemist's time.

These instruments were all developed within a short period of six months. They show a lively and active industry which means a vital contribution to both the home industry as well as exports, and this is evidence that the rate of new development is steadily increasing.

Metals and Minerals

End of a Golden Dream?

Hopes for an early rise in the gold price, dampened by President Kennedy's determination to support the dollar, have been further dispelled by the announcement of new steps intended to eliminate the U.S. balance of payments deficit, to end the strain on Treasury gold stocks, and to maintain foreign confidence.

In a special message to Congress, the President announced plans to allow banks to raise interest rates on deposits owned by foreign governments and Central Banks, in order to attract and hold dollar balances which otherwise might be converted into gold. The Treasury may also issue new securities at special rates for exclusive subscription by these governments and Central Banks. As a third measure, the Administration is to consider reforms in the International Monetary Fund, in co-operation with other lending countries. Finally, the President emphasized that the U.S. must take the lead in harmonizing the financial and economic policies of the industrialized nations.

In announcing these measures President Kennedy pointed out that the short-term capital outflow of $2,000,000,000-$2,500,000,000 had been primarily responsible for last year's $3,800,000,000 overall deficit, and he stressed that the basic deficit of $1,500,000,000 was of manageable proportions. Assuming, as at this stage there is little reason to doubt, that the proposed measures achieve their objective, it would appear that the long deferred increase in the dollar price of gold, if and when it arrives, will come at a time of America's own choosing, as an act of strength and not as a result of *force majeure*. It is, of course, arguable that if the world wants more newly mined gold it should be prepared to pay an economic price, as it would have to for any other commodity, but that, as Kipling used to say, is another story.

Technically, the most interesting of the President's proposals is the introduction of a two-tier system of interest rates, with the intention of encouraging official bodies to maintain or strengthen their holdings of dollar balances or dollar securities. The aim is to make it more attractive for Central Banks to deposit their dollars at the premium rate instead of exchanging them for gold at the expenses of the U.S. reserve or transferring them to some other country offering a higher rate of interest, which would itself convert them into gold. In this way the strain on the American reserves would be eased, while the reserves of the countries holding these funds would remain intact.

At the London fixing on Feb. 7 the price of gold, which has been steadily declining, fell by a further 2d. per f.oz. to 251s. 3d., equivalent to $35.20. This compares with 252s. on Feb. 2, 254s. 11d. on January 12, 258s. on November 3, and a peak of 290s. (unofficial) on October 19, when the gold fever was at its height.

The ceiling fixed for transactions by Central Banks under I.M.F. regulations is about 252s.

Has the price gone below 252s. simply because the Bank of England has withdrawn its support and, if so, has this support been withdrawn in the confidence that the Central Banks will not avail themselves of this opportunity of buying gold in London? If this is not the case, we may expect to see the price rise beyond 252s. again quite sharply.

FRIA REACHING PRODUCTION TARGET

Fria's new alumina factory in north-west Guinea is now reaching its first production target of 40,000 tons a month. The product is exported to the aluminium complex at Edea in Cameroun. Fria, an international combine of U.S. French, British, Swiss and German companies, has invested about $150,000,000 in this alumina project—almost exactly as much as the cost of Guinea's three-year plan financed by the Soviet Union, Mainland China, and other Communist countries. No less than 180,000 tons of equipment for the works, one of the largest and most modern in the world, had to be hauled 97 miles from Conakry. At Conakry itself a new quay was built, doubling the port's capacity, together with storage facilities for 57,000 tonnes of fuel oil and 36,000 tonnes of alumina.

The original project included studies for one of the world's biggest earth dams at Souapiti, about 25 miles away on the Konkouré river, to provide power for the production of aluminium. This scheme was dropped after independence, but the Guinea Government hopes to push ahead with it and Soviet aid has been announced. It is not yet known whether Konkouré electricity will be cheap enough to make an aluminium works at Fria an economic proposition. In the foreseeable future, all alumina will be exported.

Reserves of bauxite at Fria are estimated at 150,000,000 tonnes and are sufficient to supply the works for between 80 and 100 years.

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A recent announcement by the Cerro Corporation that it plans to acquire the assets of United Pacific Aluminium Corp., of Los Angeles, brings the entrance of a seventh U.S. producer into the primary aluminium field. United Pacific holds land options, as well as a contract for a substantial block of Pacific Northwest Power, with the declared intention of constructing a primary reduction plant.

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A plant with an initial annual capacity of 40,000 tonnes is to be constructed at Norf (Lower Rhine), West Germany, by the German aluminium concern Vereinigte Aluminium-Werke AG, of Bonn. The plant is scheduled to start production in 1963. The main bauxite supplier will be the Fria consortium, of Guinea, in which Vereinigte Aluminium-Werke has a 5 per cent holding. It is expected that the capacity of the reduction plant will eventually be increased to 60,000 tonnes a year.

RUTILE ON THE FLOOR?

The depression which has so long persisted in the Australian rutile shipment market still shows no signs of lifting. In fact, rather cheaper offers have recently been circulating and prices now range at £26 10s.-£27 10s. per l.ton c.i.f. for minimum 95 per cent material for reasonably early shipment, compared with £27-£28 previously. Some Australian producers are said to have withdrawn from the market, but even so the tone suggests that supplies remain more than adequate, especially in view of the unimpressive level of demand. The root cause is, of course, the excess of world production capacity over world consumption. Until a better balance is achieved it is hard to see much prospect of any significant improvement in prices, though some revival in buying interest can be expected in a few months, when contracts falling due for renewal in late-1961 and 1962 come up for discussion.

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Fergusson, Wild and Co. Ltd., have been appointed as European agents for Western Titanium N.L. The latter company, its process and products, were the subject of a brief note in our previous issue (*The Mining Journal*, Feb. 3, p. 118). The range includes rutile, ilmenite, zircon and monazite, as well as leucoxene, the last mentioned having a TiO_2 content of 80-90 per cent, together with a reasonably high iron content. A typical sample of the company's first grade leucoxene assays 90.3 per cent TiO_2 and is indicated at £A17 per ton f.o.b. Consideration is also being given to the production of an upgraded ilmenite which would contain 85-90 per cent TiO_2 and is tentatively priced at £A.14-£A.15 per ton f.o.b.

WOLFRAM FALLS FURTHER

Some further easing in wolfram prices has taken place, dealings currently indicating a range of 135s.-138s. per l.ton unit c.i.f Europe compared with 135s.-140s. previously and 136s.-141s. on Friday last week. The new level is reported to reflect business at slightly lower prices.

CHROME OUTLOOK STILL DULL

The past year was not a very inspiring one for chrome ore producers and so far there have been no indications that any major upturn is likely in 1961. Regular users have contracted for their 1961 supplies under their long-term agreement, but because of the uncertain economic outlook only essential requirements have been covered. In the circumstances the market is expected to pursue an uneventful course unless demand from the U.S. picks up sharply under President Kennedy's leadership. In fact, until business in the U.S. and elsewhere shows significant indications of expanssion, it is difficult to envisage any recovery of prices from the depressed levels at which they have so long remained.

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The Union Carbide Metals Co. has cut the prices of certain grades of

(Continued overleaf)

chrome in the U.S. by 9 per cent to 18 per cent, effective on shipments made from January 25.

GERMANIUM, SELENIUM AND TELLURIUM

According to the Bureau of Mines, U.S. Department of the Interior, the germanium industry in the U.S. advanced during 1960 in step with the expanding electronics field. Production and imports increased sharply, while consumption of germanium in the production of transistors and diodes held its own, despite sharp competition from high-purity silicone and other semi-conductor materials. A major breakthrough in research and development was the production of epitaxially-grown germanium crystals by vapour deposition.

An estimated 54,000 lb. of germanium were produced by American Metal Climax, American Zinc Co., Eagle-Picher Co., and Sylvania Electric Products Co. American Metal Climax is a new producer and Sylvania increased its germanium facilities in 1960. These companies rely on imported raw material, plus scrap. Eagle-Picher and American Zinc also have facilities for treating germanium-bearing zinc concentrates.

The Tsumeb mine in south-west Africa and the Prince Leopold Mine of Union Minière in the Congo dominated Free World production of germanium in 1960. Concentrates from both these producers are shipped to Oolen, Belgium, for refining. Union Minière's production of germanium totalled 26,100 kg. — almost twice the previous year's output of 13,643 kg.

Production, consumption and imports of selenium in the U.S. all fell sharply in 1960 according to the Bureau of Mines. Production is estimated at 650,000 lb. compared with 800,000 lb. in 1959. Shipments by producers fell to an estimated 680,000 lb. from over 1,000,000 lb. the previous year, but stocks of marketable selenium at producers fell by an estimated 49,000 lb. to 290,000 lb. at the end of 1960, reflecting a more stabilized supply - demand position.

The tellurium industry in the U.S. advanced in 1960 as demand for this important thermoelectrical material continued strongly, reports the Bureau of Mines. However, the widespread interest in tellurium as a thermoelectric component was still in the reasearch and development stage. Production of primary domestic tellurium in 1960 was estimated at 260,000 lb., a sharp increase from the 196,000 lb. reported in 1959. Domestic shipments by primary producers were 300,000 lb. and stocks of marketable tellurium at producers fell to an estimated 40,000 lb., the lowest figure for ten years. Imports of tellurium compounds were estimated at 20,000 lb. in 1960.

The increase in demand for tellurium was reflected in a sharp rise in the price. The price of commercial grade increased from $2.50 to $3.00 a lb. on January 1, 1960, increased again in May to $3.50, and a third time in September to $4.00. High-purity tellurium was quoted at

$25.00 a lb. throughout the year.

U.S. production of domestic tellurium in 1960 was obtained solely as a by-product of the electrolytic refining of copper and refining of lead. On April 12, 1960, a statement was released by the U.S. and Canadian producers that output of tellurium could be raised to 750,000 lb. a year. This statement was issued to counteract growing rumours of an impending shortage.

SILVER FUTURES

The Canadian Stock Exchange will start trading in silver futures towards the end of February, when it will become the only exchange outside London to do so. The decision to list silver futures reflects increasing interest in silver due to the imbalance in consumption and production. As indicated in our last week's issue (page 135), world silver consumption last year was estimated to have exceeded production by more than 100,000,000 oz. According to a statement issued in Montreal, the establishment of a second market for silver futures, is expected to increase prices with a resulting benefit to Canadian silver producers. The first contract month for trading will be May, every second month thereafter being a contract month and trading being limited to one year in advance. Spot trading is expected to start later in May.

Copper · Tin · Lead · Zinc

(From Our London Metal Exchange Correspondent)

The experts have again proved wrong as metal prices have continued their upward movement, but it is still too early to judge whether this is the beginning of a sustained recovery or not.

FACTORS STRENGTHENING COPPER

The copper market gained additional momentum on reports that there was a possibility of labour trouble amongst the white workers of the Rhodesian Copperbelt, and also from the news of trouble in Angola. In Rhodesia there is talk of a strike to show the support of the white workers for Sir Roy Welensky and his policy, and this was followed by a statement that native workers would continue to maintain essential services. Any developments along these lines could result in a stoppage of shipments of copper. If trouble in Angola spreads, this might sever the railway link between Katanga and Lobito Bay, thus cuttting down the availability of copper from that source.

Whereas last week the rise in price tended to curtail demand, this has not happened again, and demand from European consumers is reported as being maintained. On the London market the contango has shown signs of widening, although the stocks fell by 240 tons last week to a total of 15,620 tons.

In the U.S. the situation remains unchanged, and less talk is heard of a possible reduction in the customs smelter price as the intake of scrap is diminishing, partly due to the current bad weather and partly due to non-availability through sizeable exports, particularly to Japan.

The latest figures issued by the Rhodesian Selection Trust Group reflect the agreed curtailment in production, as the figure for copper produced by the Group in the last quarter of 1960 totalled 48,393 tons against 54,978 tons during the previous quarter.

TIN VERY FIRM

The tin market continues with a very firm undertone, although the price movement has not been large due partly to hedge selling of forward metal said to be against intake of Chinese tin.

Stocks in official warehouses rose by 133 tons last week to a total of 10,140 tons.

Shipments from Penang during January amounted to 6,268 tons as compared with 7,740 tons in December, and these figures seem to indicate that any sales of mine stocks released by the lifting of the export quota have almost ceased.

On Thursday the Eastern price was equivalent to £794¼ per ton c.i.f. Europe.

LEAD-ZINC IN GOOD DEMAND

The lead and zinc markets have maintained a surprisingly strong undertone, and demand for both metals is reported as being favourable. Even in the U.S. lead producers appear to be satisfied at the present demand.

It would appear that a little buying is taking place for the purpose of re-stocking prior to the Lead Zinc Study Group's meeting in March, as some people think that some measure of restriction will be recommended on that occasion. Such a view is an over-simplification of the problems, as the excess of zinc has not yet got out of hand and any upturn in general industrial activity would soon alter the picture. With lead, on the other hand, there is still an over-production, very large stocks being in the hands of producers. Any industrial revival will not have a proportionate effect on the consumption, as in the case of zinc.

Stocks of both metals continue to rise, the lead stocks now totalling 11,242 tons, a rise of 589 tons over the previous week. Zinc stocks have risen to 3,640 tons, a rise of 263 tons.

OFFICIAL TURNOVERS

Official turnovers in l.tons for the week ending February 4, with the previous week's figures in parentheses, are :

Copper	15,175	(11,250)
Tin	1,465	(1,070)
Lead	9,625	(6,775)
Zinc	6,450	(5,425)

Closing prices are as follows :

	February 2 *Buyers*	*Sellers*	February 9 *Buyers*	*Sellers*
COPPER				
Cash	£218½	£218¾	£218½	£218¾
Three months ..	£220	£220½	£220¾	£221
Settlement ..	£218¾		£218¾	
LEAD				
Current ½ month	£64¼	£64½	£64¼	£64⅜
Three months ..	£65¼	£65⅜	£65⅜	£66
TIN				
Cash	£786	£786½	£787	£787½
Three months ..	£789½	£790	£790	£790½
Settlement ..	£786½		£787½	
ZINC				
Current ½ month	£79½	£79¾	£81¼	£81½
Three months ..	£79	£79¼	£80¾	£80¾

LONDON METAL AND ORE PRICES, FEB. 9, 1961

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 251s. 2d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2½d./2s. 3d. lb
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28/£28½
Quicksilver, £69 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79⅛d. f. oz. spot and 80d. f'd.
Tellurium, 28s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis		25s. 0d./27s. 6d. per unit c.i.f.
Beryl (min. 10 per cent BeO)		240s./245s. per l. ton unit BeO
Bismuth		65% 8s. 6d. lb. c.i.f. 18/20% 1s. 3d. lb. c.i.f.
Chrome Ore—		
Rhodesian Metallurgical (semifriable 48%)	(Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
,, Hard Lumpy 45%	(Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
,, Refractory 40%	.. ..	£11 0s. 0d. per ton c.i.f.
,, Smalls 44%	(Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Baluchistan 48%	(Ratio : 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1)	Nb_2O_5 : Ta_2O_5	165s./170s. 0d. per l. ton unit c.i.f.
Fluorspar—		
Acid Grade, Flotated Material		£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)		156s. 0d. ex. works
Lithium Ore—		
Petalite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O		75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined		£28 0s./£30 0s. d/d
Magnesite Raw (ground)		£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46%-48%) basis 60s. 0d. freight		73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)		69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)		nom.
Molybdenite (85%) basis		8s. 11d. per lb. (f.o.b.)
Titanium Ore—		
Rutile 95/97% TiO_2 (prompt delivery)		£27 0s. 0d. per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2		£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)		135s. 0d./138s. 0d. per unit c.i.f
Vanadium—		
Fused oxide 95% V_2O_5		7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2		£16/£16 10s. ton c.i.f

Mining Finance

More Light on South Africa's "U" Stretch Out

We publish on page 166 an official statement from the Transvaal and O.F.S. Chamber of Mines which sets out with admirable clarity the circumstances leading up to the negotiation of the revised uranium contract arrangements with the Combined Development Agency. The statement also shows how production quotas will now be distributed as compared with the arrangements under the old contracts. Where producers are selling part or all of their quotas, the tables also show precisely which company has been the purchaser.

The announcement of the uranium stretch-out arrangements has been awaited for some months, mainly on the basis that a rationalization of production could well have led to considerably increased profits to the industry as a whole. On the original contracts several of the mines were producing uranium at profit margins which, by comparison with other South African mines and producers throughout the world, were disadvantageously low. It was anticipated that by transferring the quotas from these mines to others with a lower cost structure, all contract holders could benefit by the overall higher profitability levels.

In the event, however, from an analysis of the new fixed revenue figures it has become obvious that the price concessions made to the C.D.A. in order to gain the stretch-out have largely balanced the gains which might have been expected from concentrating production on the low cost producers. In fact the reduction in total revenue exceeds the gain on working costs by some £5,000,000 over the full 28,350 ton contract. This has, of course, been partly offset as the redistribution has also involved a change in tax liability, and may be further compensated by some at least of the producers being able to reduce their costs.

Individual mines have of course benefited to a greater or lesser degree but on the whole it may be described as "operation, as you were".

With the recent announcement from the Chamber of Mines the redistribution of the uranium contracts has been clarified. The full details of the various tonnage adjustments given in the official statement confirm the figures tabulated in this column last week, and in addition show the redistribution of individual quotas. Also the revenue and royalty figures have been published by each of the groups individually with the exception of Rand Mines whose figures are not available in London at the time of writing.

This is unfortunate as they are the only figures which prevent an industry-wide comparison of gross uranium revenue. Such a comparison would be interesting from the standpoint not only of the industry itself but also of South Africa's export earnings and foreign exchange reserves.

Analysing the available information on prices, and taking average figures for the Rand Mines group, it appears that South Africa's gross uranium revenue will be reduced by some £16,000,000, i.e. about seven per cent, and that of this reduced figure over 20 per cent will be postponed until after 1966. It had been rumoured earlier that this deficit, which in any one year may amount to as much as £8,000,000, might be made up by a short term loan from the U.K., but as yet no announcement has been made.

Among the more interesting consequences of the rearrangement of the quotas where we now have sufficient data to assess them is that Hartebeestfontein is now the biggest producer, with a total contract of 4,641 tons. Under the terms of the original Hartebeestfontein contract, uranium would have added a little under 2s. per share annually after tax and lease payments compared with the new estimate of 1s. 4½d., assuming that by refinancing, the loan repayment is also effectively spread over the ten year period. If it is paid off at the rate in the original contract, then, during the early stages, the earnings per share could be as low as 1s.

Another large producer will be the Western Reef's plant, producing both for its own mine and for Vaal Reefs. The new quota of 4,534 tons will be worth 4d. and 4½d. per share to Western Reefs and Vaal Reefs respectively after full lease and tax, although, in the case of the latter, full tax liability will not arise for two or three years.

As will be seen from the tables in the Chamber's statement, these mines have taken their additional quotas mainly from the O.F.S. joint scheme and in return will be paying a royalty of 51s. 4d. per pound, which together with the payment of 59s. from West Rand Consolidated gives an average payment of 54s. 10d. to the members of the joint scheme. These payments will be regarded as sundry revenue, which of course only attracts tax at the standard company rate of 6s., and will add between 2d. and 5d. per share, net of tax and loan, to the earnings of the various joint scheme members.

The Stilfontein joint scheme is another which has sold its quota rights. Aside from the other participants, who have also disposed of their quotas, Stilfontein itself will receive a royalty of 51s. per pound. As a result of the long stretch-out of the Stilfontein quota, which will yield very small returns in the first five years, the company has been obliged to arrange a short term loan in order to meet its uranium loan commitments. However, during the period 1965-70 the royalty payments should be worth approximately 4d. per share, by comparison with the original contract on which Stilfontein would probably have made a small loss after full tax.

As the ratio of taxation is gradually falling at Daggafontein it is difficult to assess the value of its revised contract. However it would appear that a small benefit will be gained.

Quotas for the West Driefontein/Doornfontein joint scheme and for Luipaards Vlei and Vogelstruisbult have not been adjusted, but in its announcement Gold Fields indicated that at each of these properties the revenue from uranium during the next five years will be slightly higher than would have been the case on the original contracts. The reason for this however is not clear from this initial announcement.

(*Continued on page* 168)

London Market Highlights

Following the news that the Ghana Government is to offer cash for the share capitals of five of the gold mines in the republic, the West African gold share market emerged from its customary shadow into the limelight this week. On Tuesday there was a sharp marking up in prices of the mines affected: Amalgamated Banket jumped 4½d. to 9d., Ariston 1s. 4½d. to 3s. 9d., Ghana Main Reef 10½d. to 2s. 9d. and Bibiani 1s. 6d. to 3s. 9d. When details of the cash offers were made known on Wednesday share prices were raised further to within a penny or two of the bid prices.

Other Ghana issues were helped by the view that the "fair and reasonable" take-over moves indicated an eagerness on the part of the Ghana Government to avoid upsetting overseas investors. "Casts" recovered 1s. 9d. to 16s. 4½d. and Ashanti moved up from 13s. 3d. to 15s.; the latter's rise also took into account the cash payment that will accrue from the corporation's Bibiani holding if the take-over deals go through. Similarly, Western Selection, 2s. 3d. up at 5s. 3d., responded to the stake held in the other four mines to be purchased.

While all this was going on South African golds were passing through one of their periodic bouts of depression. There was no particularly adverse news, but sentiment was not helped by President Kennedy's latest pronouncements on plans for strengthening the dollar and avoiding an increase in the gold price.

Actual selling was small but it had a marked impact on a market almost entirely devoid of buyers. By Tuesday evening Western Holdings and Anglo American had each fallen to 6s. 3d. to 143s. 9d. and 155s. respectively in line with the general downtrend. But these prices were above the worst of the day, because in the later dealings a recovery began to set in which, curiously enough, was mirrored in gold shares throughout the world markets in general. The recovery persisted with minor interruptions during quiet trading on Wednesday and Western Holdings climbed back to 143s. 9d. and Anglo American to 156s. 3d. Loraine, however, eased 6d. to 27s. 6d. on second thoughts about the annual report.

The Rhodesian share market received a much-needed fillip from the news of virtual agreement at the Southern Rhodesian constitutional talks. Nchanga (47s. 9d.) and Rhodesian Anglo (60s. 6d.) both jumped 1s. 6d. while Willoughby's rose 9d. to 8s. 6d. Helped also by dividend anticipations, Globe and Phoenix advanced 2s. 6d. to 35s., while Mangula, 1s. up at 8s., reflected a marked shortage of stocks. Chartered, which had already risen from 68s. on the higher than expected final dividend and profits, added 1s. more to 72s. 9d.

Some profit-taking brought the advance in tin shares to a standstill for a while, but the market began to move forward again on Wednesday. Ayer Hitam regained 6d. to 24s. and Gopeng were similarly better at 30s. 9d.

TRANSVAAL AND ORANGE FREE STATE CHAMBER OF MINES

SOUTH AFRICA'S NEW URANIUM PRODUCTION PROGRAMME

The Transvaal and Orange Free State Chamber of Mines, on behalf of the uranium industry, makes the following official announcement on the new agreements concluded with the South African Atomic Energy Board :—

The world demand for uranium in the immediate future has fallen off considerably owing to a relaxation in international tensions and to a deferment in most countries, including the United Kingdom, of nuclear power programmes.

Simultaneous with this decrease in demand, further and large-scale deposits of uranium have been discovered and production in America and Canada has increased tremendously.

The combination of these two factors has created a situation in which, outside the sales contracts to which America and the United Kingdom have committed themselves, the market for uranium is likely to be over-supplied until the 1970s.

To South African producers whose contracts were due to expire over the period 1964-66 this meant that most, if not all of them, would have had to close their plants with the expiry of their contracts. It is true that they would have had the benefit of the profits to be made at favourable prices under their old contracts, but to some of them the consequences of wholesale plant closure might well have proved disadvantageous in the long run both to their shareholders and to the country.

The producers that rely principally on uranium production would probably have had to close their mines on closing their plants and might never have been able to reopen them. By-product producers would have had to decide whether to dismantle their plants or maintain them in readiness to reopen them if a market for uranium, of sufficient size to warrant reopening, emerged. If the market proved to be limited, the difficult decision would have to be taken as to which producer sales should be allocated. By the time any kind of market emerged, gold mining policies might have changed and ore reserves might not be readily available for immediate production of uranium. A factor common to both types of producers would be the dislocation of the uranium industry generally, the stopping of training of personnel and the absorption of trained personnel in other occupations or even other industries.

The prices paid by the Combined Development Agency under its old agreements with the South African Atomic Energy Board, having been negotiated at a time when military demands were heavy and limited supplies of uranium were available, were favourable to South African producers and were considerably higher than prices being paid for new production elsewhere. Since these prices were based on incentive-type formula the Agency partners were not in a position to assess with any certainty their ultimate commitments under the former South African contracts which were not all due to expire until December 31, 1966. Moreover, the high price payable to South African producers was a constant embarrassment to the Atomic Energy Commission in America where domestic prices are on a lower level.

For some time the Agency partners, although fully prepared to honour their obligations to purchase the remaining tonnages of uranium oxide under the former contracts, had shown a determination to end the rise in prices attributable to an escalation factor tied to the steady increase in average mining costs in the South African mining industry and, if possible, to reduce the overall price; to secure the acceptance of a fixed price so as to be able to determine their ultimate commitment; and, in the case of the United Kingdom, to defer the deliveries of part of their share of the tonnages to be purchased into the second half of the decade 1961/70.

Since their requirements for nuclear power have been deferred, the United Kingdom understandably wish to avoid having to finance too large a stockpile of uranium not required for some years.

The majority of uranium producers and the Atomic Energy Board agreed on the advisability of seeking an arrangement that would ensure that production was maintained through to 1970 by those producers able to accommodate themselves to the situation and that would go some way to meeting the position of the Agency partners.

Obviously, there were some high-cost producers for whom the prospect of dislocating their mining operations by stretching out their output over the next ten years and deferring their income could have no attraction at all. Any arrangement would thus have to provide for these producers to keep to their contracts and their deliveries.

There were low-cost producers for whom the advantages of remaining in production were manifest. These comprised some of the younger by-product mines and one primary producer, all with large uranium ore reserves and all with long lives. These should be able to compete with the Canadian and American primary producers in the next decade when the market for uranium is expected to open up and are also able

TABLE I

ORIGINAL SOUTH AFRICAN URANIUM PRODUCTION PROGRAMME — SALES QUOTAS UNFULFILLED AS AT 31st DECEMBER, 1960.

Distribution of balance of production totalling 28,350 short tons U_3O_8, which was due for delivery between 1st January, 1961, and 31st December, 1966, under previous arrangements.
(All figures in short tons U_3O_8. "J.P.S." means Joint Production Scheme)

Area and Production Unit	*Date of Expiry of Contract*	1961	1962	1963	1964	1965	1966	*Total*
SPRINGS & BRAKPAN AREA								
Daggafontein—(A.A.)	31.12.63	283	283	283				849
Vogelstruisbult—(G.F.)	31. 3.65	103	103	103	104	26		439
Area Total		386	386	386	104	26		1,288
KRUGERSDORP & RANDFONTEIN AREA								
Luipaards Vlei—(G.F.)	30. 6.65	378	378	378	381	188		1,703
West Rand Cons.—(G.M.)	31.12.64	617	617	617	622			2,473
Randfontein Estates—(J.C.I.)—J.P.S.	31.12.64	968	968	968	976			3,880
(with: E. Champ d'Or)—(J.C.I.)	31.12.64							
Area Total		1,963	1,963	1,963	1,979	188		8,056
WEST WITS. LINE								
West Driefontein—(G.F.)—J.P.S.	30. 9.66	137	137	137	138	138	108	795
(with: Doornfontein)—(G.F.)	30. 9.66							
Blyvooruitzicht—(R.M.)	31.12.63	324	324	324				972
Area Total		461	461	461	138	138	108	1,767
KLERKSDORP AREA								
Buffelsfontein—(G.M.)	31.12.66	380	380	380	383	383	399	2,305
Stilfontein—(G.M.)—J.P.S.	31.12.64	418	418	418	422			1,676
(with: Ellaton—(G.M.)	31.12.64							
Babrosco—(G.M.)	31.12.64							
New Klerksdorp—(A.V.)	31.12.64							
Afrikander Lease)—(Ind.)	31.12.64							
Vaal Reefs—(A.A.)	31.12.66	282	282	282	284	286	299	1,715
Western Reefs—(A.A.)	31.12.63	336	336	336				1,008
Hartebeestfontein—(A.V.)	31.12.66	516	516	516	520	524	546	3,138
Dominion Reefs—(G.F.)	31.12.65	265	265	265	267	270		1,332
Area Total		2,197	2,197	2,197	1,876	1,463	1,244	11,174
WELKOM AREA								
Welkom—(A.A.)—Combined J.P.S.	31.12.65	576	576	576	581	586		2,895
Pres. Steyn-(A.A.)	31.12.65							
(with: Loraine—(A.V.)	31.12.65							
Freddies Cons.—(J.C.I.)	31.12.65							
President Brand)—(A.A.)	31.12.65							
Area Total		576	576	576	581	586		2,895
VIRGINIA AREA								
Harmony–(R.M.) (Excl. special U.K. contract)	30. 6.65	244	244	244	246	122		1,100
Virginia—(A.V.)—J.P.S.	30. 6.66	373	373	373	376	377	198	2,070
(with: Merriespruit)—(A.V.)	30. 6.66							
Area Total		617	617	617	622	499	198	3,170
TOTAL :		6,200	6,200	6,200	5,300	2,900	1,550	28,350

NOTE: In addition, the Minister of Mines, on the recommendation of the Atomic Energy Board, had approved the supply of a total of 1,127 short tons U_3O_8 to the United Kingdom Atomic Energy Authority only by the Harmony Gold Mining Co. Ltd. — 1,127.

A.A.—Anglo American Corporation of South Africa, Limited. A.V.—Anglo-Transvaal Consolidated Investment Company, Limited. G.F.—Gold Fields of South Africa, Limited. G.M.—General Mining and Finance Corporation, Limited. J.C.I.—Johannesburg Consolidated Investment Company, Limited. R.M.—Rand Mines, Limited. Ind.—Independent.

to compete now for the limited business offering. Closure of their plants in the middle of this decade might mean, with the limited but rapidly changing market, the possible loss of some business offering on an immediate basis and a limitation on their ability to re-enter the market. Moreover, refusal to meet the changed position of the United Kingdom which may well prove to be South Africa's best future customer, did not seem commonsense.

There were also other relatively high-cost producers who could not expect to be competitive in the long-term market, to whom closure or contraction of their plants would prove no real embarrassment from a mining point of view out to whom stretching out production meant an unacceptabe deferment of income. These, being indifferent, to maintaining production, were in a position to agree to the transfer of their quota entitlements to low-cost producers on a royalty basis which would give them at least the same income they were expecting and at the same rate they had expected.

The State to whom deferment of producers' income would mean a deferment of foreign exchange at a time when reserves were falling had also to be considered.

This was the background to the negotiations that preceded discussions with the Agency partners. It was apparent that with the divergence of interest between producers, any idea of superimposing a master plan on the industry designed to meet the requirements of the Agency partners would not work. The alternative was to invite the producers to formulate their own plans amongst themselves according to the position and interest of each and to attempt thereafter to marry these into a scheme acceptable to the Agency partners and the South African Government.

And so it turned out eventually. Agreement to a fixed price by the producers opposed to a change in their contracts could only be secured by a price that gave protection against the possibility of a rise in costs over their remaining contract periods. Producers indifferent to closure but interested in maintaining the flow of profits were able to arrange cession of quota rights. As was to be expected, the real deferment of production into the second half of the decade to meet the British position came from the low cost by-product producers and the one primary producer with a direct interest in remaining in operation until the 1970's. These producers, however, have had to accept a reduction in the annual rate of profit, although the total profit over the extended period will remain the same as before. The reduction in the annual rate of profit, however, will be offset to some extent by the small but additional profit to be made in the production of transferred quotas.

Following on the new arrangements, there will now be seventeen mines supplying uranium to thirteen treatment plants during the years 1961/1963. As mines cease uranium production, the number of treatment plants operating will be reduced. During 1964/1965,

(*Continued overleaf*)

TABLE 2

South African Uranium Production Programme as authorized by the Minister of Mines for the sale of 28,350 short tons U_3O_8 to the United States Atomic Energy Commission and the United Kingdom Atomic Energy Authority between 1st January, 1961 and 31st December, 1970.
(All figures in short tons U_3O_8. "J.P.S." means Joint Production Scheme)

Area and Production Unit	*Date of Expiry of old Contract*	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	*Sub-Total*	*Grand Total*
SPRINGS & BRAKPAN AREA													
Daggafontein (A.A.)	31.12.63	171	150	150									471
Vogelstruisbult (G.F.)	31. 3.65	103	103	103	104	26							439
Area Total		274	253	253	104	26							910
KRUGERSDORP & RANDFONTEIN AREA													
Luipaards Vlei (G.F.)	30. 6.65	378	378	378	381	188							1,703
West Rand Cons. (G.M.)	31.12.64	431	234	234	234	234	234	234	234	234	170	2,473	
Add: Transferred from Welkom/Pres. Steyn—J.P.S.		200	290	290	290	290						1,360	3,833
Randfontein Estates (J.C.I.)—J.P.S. (with: East Champ d'Or)	31.12.64	788	720	670	510	312							3,000
Area Total		1,797	1,622	1,572	1,415	1,024	234	234	234	234	170		8,536
WEST WITS. LINE													
West Driefontein (G.F.)—J.P.S. (with: Doornfontein) (G.F.)	30. 9.66	137	137	137	138	138	108						795
Blyvooruitzicht (R.M.)	31.12.63	240	146	147	146	147	146					972	
Add: Transferred from Randfontein Estates		120	140	140	170	170						740	1,712
Area Total		497	423	424	454	455	254						2,507
KLERKSDORP AREA													
Buffelsfontein (G.M.)	31.12.66	231	231	231	231	231	230	230	230	230	230	2,305	
Add: Transferred from Stilfontein (G.M.)—J.P.S. (with: Ellaton, Babrosco, Afrikander Lease, but excluding New Klerksdorp transferred to Hartebeestfontein)	31.12.64	151	151	150	150	150	151	151	151	151	151	1,507	3,812
Vaal Reefs (A.A.) (Joint operating scheme) (See Note)	31.12.66	273	291	282	284	286	299					1,715	
Western Reefs (A.A.	31.12.63	336	336	336								1,008	
Add: Transferred from Daggafontein	31.12.63	1	4	6	20	19	16	78	78	78	78	378	
Add: Transferred from Welkom/Pres. Steyn—J.P.S.	31.12.65	2	14	21	72	71	61	298	298	298	298	1,433	4,534
Hartebeestfontein (A.V.) on own account 3,138 Tons	31.12.66	500	500	500	500	450	450	450	450	450	391		4,641
Add: Transferred from Virginia/Merries 1,334 ,,	30. 6.66												
Add: Transferred from New Klerksdorp 169 ,,	31.12.64												
Dominion Reefs (G.F.)	31.12.65	238	210	210									658
Area Total		1,732	1,737	1,736	1,257	1,207	1,207	1,207	1,207	1,207	1,148		13,645
WELKOM AREA													
Welkom (A.A.)—J.P.S.	31.12.65	102											102
President Steyn (A.A.) —J.P.S. (with: Loraine, Freddies Cons. and Pres. Brand)	31.12.65												
Area Total		102											102
VIRGINIA AREA													
Harmony (R.M.) (excl. special U.K. contract—see below)	30. 6.65	178	122	122	122	122	122	122	122	68		1,100	
Add: Transferred from Randfontein—J.P.S.		60	40	40								140	
Add: Transferred from Dominion Reefs		27	55	55	267	270						674	1,914
Virginia (A.V.)—J.P.S. (with: Merriespruit) (A.V.)	30. 6.66	130	130	130	135	140	71						736
	30. 6.66												
Area Total		395	347	347	524	532	193	122	122	68			2,650
TOTAL		4,797	4,382	4,332	3,754	3,244	1,888	1,563	1,563	1,509	1,318		28,350
VIRGINIA AREA													
Harmony (R.M.) (special U.K. contract)	31.12.66	200	180	180	—	—	78	78	78	132	201		1,127

NOTE—Royalties are payable to transferers of quotas in the year to which those quotas formerly related, despite the deferment of the production of the relevant tonnages indicated in the above tables.

eleven plants will be operating and in 1966 the number will fall to eight; for the remaining four years, 1967/1970, there will be six mines supplying five treatment plants.

In the previous tables are set out the original uranium production programme and the new programme as now authorized by the Minister of Mines.

Table 1 shows the distribution of the balance of production totalling 28,350 short tons of uranium oxide which was due for delivery to the Combined Development Agency between January 1, 1961, and December 31, 1966, under the previous arrangements.

Table 2 shows the uranium production programme for the sale of the same quantity, 28,350 short tons of uranium oxide, to the United States Atomic Energy Commission and the United Kingdom Atomic Energy Authority between January 1, 1961, and December 31, 1970, under the new arrangements.

MINING FINANCE—*Continued*

URANIUM'S EARNINGS IN RELATION TO SHARE VALUES

As a result of the "cost plus" type of contract, the industry has from the beginning been obliged to maintain separate cost figures for uranium production, although it was only after the relaxation of the security regulations in 1958 that these figures were published. With the fixed price system it seems likely that it will no longer be necessary to continue costing uranium production separately and in fact those mines, which now dissect their costs by responsibility rather than process, will no doubt be anxious to discontinue the separate publication of uranium costs.

Also it is at least arguable that the industry would be in a better position to negotiate open market contracts after 1970 if its uranium costs were confidential. For our part we remain sceptical on this point, although it may have some validity if the negotiation of post-1970 contracts turn out to be linked to political spheres of influence rather than to be conducted as an open market operation, in which case price would be determined almost entirely by the weight of demand.

From the investors' standpoint, it would however be regrettable if these figures were no longer published for the reason, often stressed in these columns, that prudence demands that any estimates of future earnings be calculated on a gold only basis with the the uranium profit considered as a welcome but relatively short term sweetener.

In the same way, many of the mines have been able by virtue of uranium earnings, to reduce the weight of loan capital during the development stage so that these earnings have not resulted in higher levels of dividends, although they have enabled them to be reached sooner. It is therefore to be hoped that even if the method of publication is modified the groups will continue to give some indication of the approximate proportion of profits which are attributable to uranium production.

GHANA OFFERS CASH FOR ITS MINES

A compromise has been reached between the mine managements and the Ghana Government over the vexed question of the gold properties in that country which have been rendered uneconomic by the government's statutory wage increase imposed as from July 1 last and which were thus proposing to close down, a solution not acceptable to the government as quickly indicated by the bristling Mines (Abandonment) Bill the main clauses of which were outlined here on January 27. The compromise takes the form of a Ghana Government cash bid for the shares not only of the mines which were threatening closure, Bibiani and Amalgamated Banket, but also for three concerns which are still profitable, Ariston, Bremang and Ghana Main Reef. This would leave only the Ashanti and Konongo mines in U.K. hands.

The prices which are being offered for the shares are shown in the accompanying table along with the market quotation ruling at the end of last week before the idea of a take-over became known and also with the highest levels at which the shares have stood over the last fourteen months. On the basis of market quotations during recent times holders of Bremang are coming off best. They will be obtaining, in fact, the highest price that the 2s. stock units have attained for the past decade. It certainly looks as though there is little to grumble about here.

	High 1960-61		*Price Feb. 3*		*Bid Price*	
	s.	d.	s.	d.	s.	d.
Amal. Banket ...	1	10½	0	3¾	1	0
Ariston	5	6	2	4½	4	0
Bibiani	4	4½	2	3	4	0
Bremang ...	3	9	2	0	3	9
Ghana Main Reef	3	9	1	7½	3	0

In any case, the Boards of the respective companies are recommending acceptance of the bids by their shareholders. "Fair and reasonable" says the Western Selection group which works four of the mines. "The directors will be prepared to recommend acceptance of this offer subject to detailed conditions of the formal offer being satisfactory," says Bibiani a little more cautiously. This company is in the same stable as Ashanti Goldfields. Bibiani holders, incidentally, will get the final dividend of 2.4d. recently declared and payable next month. The whole deal has on it the stamp of responsibility by having been arranged under the auspices of the London bankers, Philip Hill, Higginson, Erlangers.

The amount of money involved in the bids are £961,633 for Amalgamated Banket, £2,057,143 for Ariston, £978,159 for Bremang, £668,617 for Ghana Main Reef and £500,000 for Bibiani, a total in all of £5,165,552. Is this enough? It is very doubtful whether it is on a strictly accounting basis. On the other hand, if there had been no bids and the mines had had to carry on under threat of duress it is probable that share market prices would levels. Moreover, non-acceptance could put a holder in an embarrassing position if he became a minority holder in a concern being run as a nationalized industry.

EFFECT ON ASHANTI—

The 4s. shares of Ashanti Goldfields participated in the market recovery, rising to 15s. ex dividend compared with a 1960-61 swing between 12s. 6d. and 25s. Through its wholly-owned subsidiary, the West African Finance Corporation, Ashanti is believed to hold quite a substantial number of Bibiani. But the real reason for the share advance was the feeling that the mine may be able to continue smoothly along its prosperous path now that the Ghana Government has adopted a much more reasonable attitude over the "close-down" affair than some people feared that it might. Ashanti's working profits are keeping up with those of a year ago despite the wage in-

GHANA GOLD QUARTERLIES

	Year ends	*Quarter*	*Tons milled (000)*	*Ounces (000)*	*Grade dwt./ton*	*Cost per ton* s.	d.	*Working profit (£000)*	*Govt. duty (£000)*	*Net Profit Before Tax (£000)*
Amalgamated Banket	S	Mar.	182·0	39·3	4·3	48	0	52·9	*a*	*a*
		June	168·0	38·1	4·5	50	5	51·0	*a*	*a*
		Sept.	156·7	36·1	4·6	57	3	1·6	*a*	*a*
		Dec.	148·6	33·8	4·5	53	9	29·1	*a*	*a*
Ariston	S	Mar.	121·1	39·3	6·5	55	8	151·7	*a*	*a*
		June	122·4	38·2	6·2	54	8	139·4	*a*	*a*
		Sept.	118·5	35·7	6·0	60	7	84·5	*a*	*a*
		Dec.	114·7	32·3	5·6	54	3	96·9	*a*	*a*
Ashanti	S	Mar.	106·5	88·2	16·6	74	8	707·2	82·6	449·5
		June	107·0	87·7	16·4	77	6	682·1	79·8	431·3
		Sept.	109·5	89·6	16·4	74	5	717·5	89·9	452·1
		Dec.	112·0	90·0	16·1	89	5	643·5	82·7	440·3
Bibiani	S	Mar.	95·0	21·0	4·4	42	2	62·8	—	12·2
		June	97·0	20·7	4·3	40	7	62·1	—	10·3
		Sept.	99·0	21·2	4·3	41	3	61·2	—	8·6
		Dec.	101·0	20·4	4·0	41	9	47·4	—	L2·0
Bremang	D	Mar.	2663·8*	15·5	3·0†		10‡	81·2	*a*	*a*
		June	2717·1*	16·9	3·2†		11‡	83·2	*a*	*a*
		Sept.	2920·3*	14·6	2·4†		10‡	61·9	*a*	*a*
		Dec.	2773·9*	12·8	2·2†	1	0‡	27·8	*a*	*a*
Ghana M.R. ..	J	Mar.	36·8	12·6	6·8	60	4	45·3	*a*	*a*
		June	33·3	13·1	7·8	68	2	49·1	*a*	*a*
		Sept.	34·0	12·6	7·4	73	2	32·3	*a*	*a*
		Dec.	33·7	12·9	7·7	75	7	36·4	*a*	*a*
Konongo	S	Mar.	21·0	10·6	10·1	102	6	24·0	1·3	22·6
		June	21·8	10·6	9·7	99	6	23·0	—	23·0
		Sept.	21·9	10·3	9·4	98	10	19·6	—	19·6
		Dec.	21·4	11·5	10·7	116	0	20·6	1·5	19·1

Footnotes: * Cu. yds. dredged. † Grains per cu. yd. ‡ Per cu. yd. *a* Not available.

The cost per ton and profit figures for the Sept. quarter for all mines other than Konongo have been provisionally adjusted to take account of the increase in African wages with effect from July 1, 1960.

creases. The total for the first four months of the current financial period is £589,908 compared with £591,866 in the same months of 1959-60. The shares yield 14.4 per cent on the 2s. 2d. paid for that year.

—AND WESTERN SELECTION

At September 30, 1959, Western Selection had 49 per cent of its investments by value in Ghana so it obviously stands to receive quite a substantial proportion of the bid money. The company's dividend for the year to September 30 last is due to be announced in May. The chairman, Mr. C. J. Burns, forecast last June that profits for 1959-60 looked like being up by about 30 per cent. In which case with the company's liquidity likely to have been considerably increased by May if all goes well, there could be quite a good distribution. There will also be the question of what the Board proposes to do with the Ghana money. At 5s. 3d. the 5s. units yield 7.6 per cent on last year's 8 per cent payment.

The Western Selection mines' December quarterlies are reported alongside. Bremang's profits are well down, the result of sandy conditions adversely affecting the operations of Nos. 1 and 2 dredges while No. 3 has been passing through low values. Only No. 4 dredge has been meeting with excellent condition. Fluctuations of this sort are inevitable in a dredging concern.

BLINKPOORT AND F.S. GEDULD

Blinkpoort Gold Syndicate's chief asset is its shareholding in Free State Geduld the Orange Free State gold mine the prospects for which were discussed here at length last week. It is thus possible that Blinkpoort's rising dividend record may be at an end for the time being in view of F.S.G.'s conservative distribution outlook. For the year to September 30 last Blinkpoort's dividend totalled 4s. 7½d. per 5s. share which meant a pay-out of £578,125 or virtually all the net profit of £584,052.

Quoted investments stand in the balance sheet at £1,784,023, but despite last year's Kaffir market malaise the Stock Exchange value at September 30 last was £9,049,007. A year previously it was £12,073,091. Blinkpoort are 52s. 6d. to yield 8.8 per cent.

LORAINE'S NEW BORROWING

Mr. B. L Bernstein, chairman of Loraine Gold Mines, has a story of good progress to tell in his annual statement accompanying the report of this Orange Free State gold mine, but there have been one or two disappointments. Faulting and ventilation difficulties have held up development work to some extent on the Elsburg series reefs in the former Riebeeck section on which the future of this mine now largely depends. Even so, the reserves now include 551,000 tons on these reefs with the satisfactory average gold value of 8.29 dwts. a ton. This enables Mr. Bernstein to forecast a further improvement in the present mill grade of 4.427 dwts. as more ore is drawn from the Elsburg series.

On the financial side the company is having to resort to short-term borrowing because gold revenue has fallen short of expectations and shaft-sinking delays

(Continued on page 172)

WESTERN SELECTION AND DEVELOPMENT GROUP

Registered Offices: 120 Moorgate, E.C.2

Extract from Mining Companies' Directors' Reports for Quarter ended 31st December, 1960

ARISTON GOLD MINES (1929) LTD.

Authorised Capital £1,500,000
Issued Capital £1,285,714
In 10,285,714 Units of Stock of 2s. 6d. each.

OUTPUT AND PROFIT

Tons Milled	114,730	
Gold Produced—fine ozs.	32,286	
Recovery per ton—dwts.	5.628	
	£	Per Ton Milled s. d.
Working Revenue	408,083	71 2
Working Expenditure	311,217	54 3
(a) Working Profit	96,866	16 11

CAPITAL EXPENDITURE

Capital Expenditure during the Quarter amounted to £29,938.

DEVELOPMENT

A total of 6,212 feet of development was advanced during the Quarter, the total expenditure being £40,426.

NORTH OREBODY

28th Level
The North split of this Orebody shows a payable length of 189 feet averaging 5.9 dwts. over 45 inches between Nos. 255 North and 258 North Crosscuts.

	Value Dwts.	Width Inches
29th Level		
No. 240 North Crosscut	3.9	33
No. 241 North Crosscut	6.0	42

No. 2 OREBODY

	Value Dwts.	Width Inches
9th Level North		
No. 216 North Crosscut	7.4	84
11th Level North		
No. 216 North Crosscut	8.7	166
No. 217 North Crosscut	1.4	150
26th Level South		
No. 218 South Crosscut	11.6	120
27th Level South		
No. 220 South Crosscut	3.5	64
28th Level North		
No. 208 North Crosscut	10.3	59
No. 209 North Crosscut	5.5	60
30th Level North		
No. 205 North Crosscut		
(footwall reef)	6.2	34
(hanging wall reef)	3.6	30
No. 206 North Crosscut		
(footwall reef)	3.3	69
(hanging wall reef)	1.4	53
No. 207 North Crosscut		
(footwall reef)	7.2	39
(hanging wall reef)	Not Sampled	

WEST REEF

15th Level		
No. 210 South Crosscut	9.1	52

SOUTH OREBODY

5th Level		
No. 291 South Crosscut	5.2	35
No. 292 South Crosscut	5.6	75
No. 293 South Crosscut	9.7	37

There are no comparable values to the above in this vicinity on the 3rd or the 6th Levels. Footwall driving continues to the South.

SHAFT SINKING

No. 4 Winze—Sinking advanced to 11 feet below the 29th Level horizon.

Ankobra Shaft—Sinking advanced to 29 feet below the 6th Level Station and cross-cutting towards the reef channel has started on the 5th and 6th Levels.

AMALGAMATED BANKET AREAS LTD.

Authorised Capital £3,300,000
Issued Capital £2,884,900
In 19,232,669 Units of Stock of 3/- each.

OUTPUT AND PROFIT

Tons Milled	148,608	
Gold Produced—fine ozs.	33,786	
Recovery per ton—dwts.	4.547	
	£	Per Ton Milled 2s. d.
Working Revenue	428,280	57 8
Working Expenditure	399,223	53 9
(a) Working Profit	29,057	3 11

CAPITAL EXPENDITURE

Capital expenditure during the Quarter amounted to £10,415.

DEVELOPMENT

A total of 7,605 feet of development was advanced during the quarter, the total expenditure being £76,700.

BREMANG GOLD DREDGING CO., LTD.

Authorised Capital £1,250,000
Issued Capital £521,685
In 5,216,848 Units of Stock of 2s. each.

OUTPUT AND PROFIT

Cubic Yards Dredged	2,773,900	
Gold Produced—fine ozs.	12,843	
Recovery per Cubic Yard—Bullion—Grains	2.16	
	£	Per Cubic Yard Dredged d.
Operating Revenue	162,441	14.05
Operating Expenditure	134,615	11.65
Operating Profit	27,826	2.40

Capital Expenditure during the Quarter amounted to £12,312.

GHANA MAIN REEF LTD.

Authorised Capital £1,500,000
Issued Capital £1,114,363
In 4,457,450 Units of Stock of 5/- each.

OUTPUT AND PROFIT

Tons Milled	33,662	
Gold Produced—fine ozs.	12,923	
Recovery per ton—dwts.	7.678	
	£	Per Ton Milled s. d.
Working Revenue	163,631	97 3
Working Expenditure	127,211	75 7
(a) Working Profit	36,420	21 8

CAPITAL EXPENDITURE

Capital Expenditure during the Quarter amounted to £7,420.

DEVELOPMENT

A total of 1,346 feet of development was advanced during the Quarter, the total expenditure being £11,606. Footage sampled amounted to 825 feet of which 120 feet proved payable averaging 7.89 dwts. over 58.5 inches.

(a) Excluding Development Redemption

BUFFELSFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

URANIUM PRODUCTION

The South African Atomic Energy Board has arranged that as from 1st January, 1961, the balance of uranium to be delivered under the existing contracts is to be purchased at fixed prices per lb. and the production is in some instances to be stretched out over the next ten years. The production of uranium by this company will, in consequence, be substantially modified in accordance with particulars set out hereunder. It should be noted that the fixed selling prices, as stated, will be subject in varying degree to minor reductions as a result of adjustments within the industry which remain to be finally calculated, but will thereafter be constant.

This company has been allocated in replacement of its existing contract a total quota of 2,305 tons to be produced at an even rate over the ten-year period expiring in December, 1970, and sold at a fixed price of 74.65 shillings per lb.

The Company has a treatment plant capable of producing approximately 500 tons of uranium per annum and in order to increase its rate of production on a stretched out basis to an economic level it has concluded negotiations with Stilfontein Gold Mining Company Limited, the Afrikander Lease Limited, Babrosco Mines (Proprietary) Limited and Ellaton Gold Mining Company Limited for the acquisition of the balance of their quota rights remaining for production from January, 1961, onwards totalling 1,507 tons with an average fixed selling price of 80.05 shillings per lb. All these companies are contributors to the Stilfontein joint uranium production scheme which is ceasing operations and is at present closing down. The tonnage to be acquired will, therefore, be reduced to the extent of the output of this joint plant from the 1st January to the date of final closure. Subject to this adjustment the additional tonnage will be produced at an even annual rate over the ten-year period expiring in December, 1970.

In consideration of the acquisition of these quotas the Company has undertaken to make royalty payments which average 49.44 shillings per lb. The individual royalties will be marginally reduced when the new selling prices of the relative quotas acquired by this Company are finalised.

The total earnings of the company from uranium under these new conditions will be substantially more than those which would have accrued under the existing contract. These earnings will, however, be stretched out over a longer period with a resulting decrease in annual earnings. It will in consequence be necessary for this company to arrange short term borrowings to finance a portion of its capital expenditure programme as foreshadowed by the chairman in the course of his remarks at the last annual general meeting.

In common with other producers this company has applied for interest-free advances to assist it in repaying the quarterly instalments due under the existing loan agreements by December, 1966.

It is anticipated that the Stilfontein joint plant will cease operations during February after which these new arrangements will come into full force. The monthly profit declarations during these two months will be affected accordingly and cannot be accepted as a reliable indication of future possibilities.

By Order of the Board,
GENERAL MINING AND FINANCE CORPORATION LIMITED
London Secretaries,
per R. R. BISHOP

London Office:
Winchester House,
Old Broad Street, E.C.2.
1st February, 1961.

STILFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

URANIUM PRODUCTION

The South African Atomic Energy Board has arranged that as from 1st January, 1961, the balance of uranium to be delivered under the existing contracts is to be purchased at fixed prices per lb. and the production is in some instances to be stretched out over the next 10 years. In these altered circumstances the company has decided to cease the production of uranium as set out hereunder. It should be noted that the fixed selling prices, as stated, will be subject in varying degree to minor reductions as a result of adjustments within the industry which remain to be finally calculated, but will thereafter be constant.

This company has been allocated in replacement of its existing contract a quota of 690 tons to be produced over the next ten years which will be purchased at a fixed price of 81.95 shillings per lb., as from 1st January, 1961.

In view of this company's relatively low grade of uranium, coupled with the fact that the company now has to provide for the full incidence of tax, it is estimated that under existing circumstances the profit from the production of this tonnage after meeting both tax and loan repayments would have made a negligible contribution to the distributable profits.

The company has therefore arranged to dispose of its quota rights remaining after the treatment plant closes, to Buffelsfontein Gold Mining Company Limited and will receive royalties which, after due provision has been made for those portions of the outstanding joint plant loan repayments which are at present the responsibility of the other members of the joint scheme, will amount to 51 shillings per lb. This figure may be varied as and when the final selling price of this quota is established.

Buffelsfontein G.M. Co. Ltd. has undertaken to produce 620 tons under this quota at an even rate from 1965 to 1970 and the balance over the first four years. It is estimated that these arrangements will produce a significant additional income to the company from 1965 onwards.

This company has applied for interest-free loans to enable it to meet in full the quarterly instalments due in terms of the present loan agreements to be paid up to the end of 1964.

JOINT PLANT

As all members of the Stilfontein Joint Uranium Production Scheme have disposed of their quota rights, the plant will be closed down as soon as practicable. The question of the maintenance or the disposal of the joint plant and pipeline is receiving the consideration of the interested parties. It is estimated that the small annual quota allocated to this company for production in 1961 will have been produced in the closing down operations of the plant, and that there will be no further income from uranium during the balance of the year.

By Order of the Board,
GENERAL MINING AND FINANCE CORPORATION LIMITED
London Secretaries,
per R. R. BISHOP.

London Office:
Winchester House,
Old Broad Street, E.C.2.
1st February, 1961.

LORAINE GOLD MINES, LIMITED

(Incorporated in the Union of South Africa)

MR. B. L. BERNSTEIN REVIEWS PROGRESS

The Eleventh Annual General Meeting of Loraine Gold Mines, Limited, will be held on March 9 in Johannesburg.

The following are extracts from the review by **Mr. B. L. Bernstein,** the chairman, which has been circulated with the Report and Accounts for the year ended September 30, 1960 :—

The year under review has seen the completion of the first stage of the programme to exploit the Elsburg reefs in the Riebeeck area of the property. No. 3 shaft has been commissioned and the twin haulage on 52 level, which has been advanced from No. 2 shaft, was holed through into No. 3 shaft. Seven stations have been established in this shaft from the 44th to the 56th levels and development work has been concentrated on the 48th, 50th and 54th levels, so that reef connexions between levels can be established as soon as possible and preparations made for the start of stoping.

Development in the No. 3 shaft area up to the end of the December quarter amounted to 24,366 feet, but as nearly all this footage was in country rock, either in the vicinity of the shaft or in crosscuts advanced to establish contact with the reef, very limited development on Elsburg reefs has so far been done. Faulting has resulted in longer crosscuts to the reef horizon than had originally been anticipated and high rock temperatures require the development of twin crosscuts as well as twin haulages on each level. Ventilation facilities available will ultimately determine the amount of stoping which can be undertaken.

In spite of some delays on the 48th and 50th levels, due to the intersection of water-bearing fissures, a very satisfactory build up in the rate of development at No. 3 shaft has been achieved and this, together with the speed of advance on the 52 level haulages and the accuracy of the holings, reflects great credit on all concerned. Development sampled on the Elsburg reefs totalled 2,470 ft. for the quarter ended December 31, 1960, and of this footage 67.8 per cent was classed as payable at an average value of 931 inch-dwt. and 27.14 inch-lb. over a channel width of 50.5 in. Development on Basal reef has been virtually stopped owing to poor values. "B" reef development has been greatly reduced and confined to the more promising areas, and of the footage sampled on this reef during the quarter ended December 31, 1960, 45 per cent was payable at 662 inch-dwt. and 28.04 inch-lb. over a channel width of 15.3 in.

Increased Ore Reserve

The total ore reserve at September 30, 1960, was 1,234,000 tons at an average value of 6.90 dwt. per ton, an increase of 142,000 tons and 1.68 dwt. per ton over the corresponding figures for the previous year. The ore reserves on Elsburg reefs of 551,000 tons at a value of 8.29 dwt. increased by 404,000 tons, while those on the Basal and "B" reefs decreased by 239,000 tons and 23,000 tons respectively.

During the year under review the tonnage milled increased by 20,000 tons to 947,500 tons, and the recovery grade increased by 0.283 dwt. to 4.192 dwt. per ton. Due to a limited number of high grade stope faces being available and to an unexpected decline in values in the Basal and "B" reefs, the increase in recovery grade was less than anticipated. Ore drawn from the Elsburg reefs during the year amounted to 20 per cent of the total tonnage milled and during the quarter ended December 31, 1960, had increased to 39 per cent. The recovery grade improved to 4.427 dwt. per ton during this quarter and it is expected that a further increase will take place as it becomes possible to draw more ore from the Elsburg reefs.

Capital Expenditure

Capital expenditure during the financial year totalled £2,600,670, details of which are set out in the technical advisers' report. During the year ending September 30, 1961, capital expenditure is estimated at £1,000,000 to be spent mainly on the completion of No. 3 shaft and ancillary development, and on a Native compound at this shaft. While it had been expected that the proceeds of the share issue made during February, 1959, together with the additional loan of £1,000,000 from the Anglo American Corporation of South Africa, Limited, would enable the company to complete the sinking of No. 3 shaft, to carry out the necessary development and to bring the Riebeeck section of the combined mining area to production, these funds will not in fact be sufficient. Revenue from gold has fallen short of expectations and the capital cost of all operations at No. 3 shaft has exceeded original estimates by some £400,000, mainly as a result of shaft sinking delays. Since the end of the financial year, the balance of capital funds amounting to £152,030 and the unappropriated profits of £283,197 have been utilized. Additional funds have therefore to be found to finance current capital expenditure and until such time as profits increase sufficiently, your company will require temporary facilities. These facilities up to a maximum of £700,000 have been obtained from the Anglo-Transvaal Finance Corporation (Proprietary) Limited, to be drawn as and when required by the company. They were made available from January 1, 1961, and are repayable by December 31, 1962. Interest will be at the rate of 7 per cent per annum, or at a rate of 2½ per cent above the bank rate of the South African Reserve Bank for the time being, whichever is the higher. A commitment charge of 1 per cent per annum is payable on undrawn balances.

Income of £21,250 was received from the company's investment in the Anglo American (O.F.S.) Housing Company Limited, which paid its maiden dividend of 5 per cent. This dividend, reflected in the accounts under "Income from trade investments", is included in the total profits of £235,888 for the year, which show a small increase over the previous year.

BLINKPOORT GOLD SYNDICATE LIMITED

The annual general meeting of Blinkpoort Gold Syndicate Limited will be held in Johannesburg on February 28.

The circulated review by the chairman, **Mr. C. S. McLean,** is as follows :—

The annual report and audited accounts for the year ended September 30, 1960, once again reflect a higher profit and dividend distribution following the pattern set by Free State Geduld Mines Limited, in which your company's main investment lies.

In his recently published review, Mr. Spiro, the chairman of Free State Geduld Mines Limited, referred to the highly satisfactory progress last year in all spheres of its operations and stated that the indications were that when additional facilities became available to hoist ore in the south-western section of the mine, still further improvements in profits could be expected. He mentioned, however, that a conservative dividend policy would be followed to enable the company to meet heavy capital expenditure commitments, which would coincide with the initial tax and lease payments in 1961 and 1962, respectively. I would direct your attention to his comments on the year's development operations to the effect that the decrease in value to 1,396 inch-dwt. from 1,547 inch-dwt. in the previous year was mainly attributable to the greater development footage undertaken in the No. 2 Shaft area, principally north of the shaft where values are lower than in the area to the south and to the comparatively smaller footage of reef development in the No. 1 Shaft area. Ore reserves at September 30, 1960, amounted to 3,023,000 tons, an increase of 257,000 tons over the previous financial year, although much of the development during the year was for exploration purposes.

Mr. Spiro reviewed in detail the programme for future development of the mine and in this regard it is pleasing to note his re-affirmation of the rich potential of the south-western area and the steps that are being taken for its exploitation. He stated that in the light of information obtained from underground development and drilling during the year, it had become apparent that the reef in a large part of the south-western area lies between the 35 and 43 levels which is shallower than the existing stations at No. 1 Shaft. In view of this and the general remoteness of the area from No. 1 Shaft, it was decided in July, 1960, to sink a new hoisting shaft adjacent to the No. 1A Ventilation Shaft for the more rapid and economic exploitation of this comparatively rich area. The capital expenditure to be incurred in sinking and equipping this hoisting shaft, which will be known as No. 4 Main Shaft, on rail transport to the reduction plant, and in the provision of the necessary surface buildings, including a new Native hostel, has been estimated at £2,900,000, which will be financed out of profits.

Mr. Spiro mentioned also that although the water table in the Orange Free State goldfields is tending to fall, concentrations of water under high pressure may still be encountered underground due to the heavy faulting of the strata being mined. From the experience of early years, the techniques necessary to combat this particular hazard have been developed and the risks can be minimized by taking necessary, but often costly, precautions.

In the light of Mr. Spiro's review, I feel sure that shareholders will agree with me when I again express my confidence in the bright future of the Free State Geduld mine, with which our company's fortunes are so closely linked.

In conclusion, I wish to thank General Mining and Finance Corporation Limited, our secretaries, and the members of its staff for their loyal and able services during the past year.

MINING FINANCE—*Continued*

have caused capital expenditure to exceed estimates by some £400,000. In the year to next September expenditure is expected to be around £1,000,000. Loan facilities up to a maximum of £700,000 have been obtained from Anglo-Transvaal Finance Corporation (Proprietary) repayable by the end of 1962. Loraine 10s. shares at 27s. 6d. have been attracting one of their periodic bouts of speculative attention just lately. A Johannesburg broker has gone on record as saying that "even the most conservative of calculations indicate that Loraine is under-priced at anything below 30s.". It is expected that Mr. Bernstein will bring the picture right up to date at the meeting on March 9.

LOWER COPPER PROFITS

The copper profits of the Rhodesian Selection Trust group also fell away last quarter as the accompanying table shows. The production cutbacks actually amounted to as much as 12 per cent, although sales fell by rather less than 10 per cent. Total production of the group amounted to 48,393 tons compared with 54,978 tons in the September period. Mufulira received an average price for its copper of £227 a ton against £245 in the September quarter and Roan also received £227 against £241. The present London cash price of the metal is £220.

So, as with Chartered, the mines face a fresh cut in earnings during the March quarter. Yields on the shares are high enough, however, to discount the prospective dividend cuts for 1960-61. Here also Rhodesian politics are the chief market factor and it was notable that the Southern Rhodesian agreement caused a lift in prices. That doyen of the market Rhokana have improved to 46s. and the yield is still over 15 per cent on last year's payment.

PROFITS BEFORE TAX

	Sept. Qtr. £000's	Dec. Qtr. £000's	6 mnths. to Dec., 1959 £000's	6 mnths. to Dec., 1960 £000's
Chibuluma	345	230	825	575
Mufulira	2,244	1,477	3,964	3,721
Roan Antelope	1,507	1,071	2,785	2,578
Rhod. Selection	1,636	1,083	3,014	2,719

Of interest to holders of R.S.T. is that Chibuluma, in which a 65 per cent stake is held, is now within £862,000 of the final repayment of its loan from the U.S. Government. It is thus possible that 1961-62 will see the first dividend revenue accruing to R.S.T. from this young mine.

Inco Dividend.—Last November International Nickel raised its quarterly dividend from 37½ c. up to 40 c. (equivalent to an increase from 75 c. up to 80 c. on the shares prior to the 2 for 1 split). This increased dividend is now being maintained in respect of the first quarter of 1961 payable on March 20. If in addition to maintaining this higher dividend rate, Inco repeats at the end of 1961 its practice of declaring a bonus dividend, distributions may well come near to the record levels of 1955 and 1956.

Bay Hall Trust Results.—The report and accounts of Bay Hall Trust, in the Union Corporation group, reveal an aggregate book value of investments a December 31,1960, of £4,549,712 agains a current valuation of £7,347,009. O this portfolio, 48.1 per cent is in com mercial and industrial equities in th U.K., 34.6 per cent is in mining financ (mainly in South Africa) and 5 per cen in individual mining enterprises.

In 1960, net profit amounted t £219,290 (£173,596). The recommende final dividend of 6 per cent would wit the interim make a total distribution fo the year of 9 per cent.

Merriespruit London Office.—Th office of the London secretaries and th London transfer office of Merriespruit (O.F.S.) Gold Mining are now at A. Moir and Co. 4, London Wall Buildings London, E.C.2.